The Impact of the Financial Institutions Scheme on Australian Credit Unions

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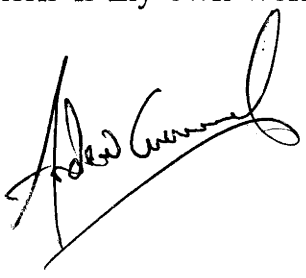
Sub-rule 15(2) Statement

I certify that this thesis is my own work and all sources used have been acknowledged.



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Abstract

Credit unions represent an institutional response to economic problems of information asymmetry. This thesis develops an economic theory of credit union behaviour that explains institutional characteristics including mutuality and the common bond of association. This theory is used to analyse the impact of uniform State-based regulation of credit unions - the Australian Financial Institutions Scheme. This analysis is tested through an empirical study of a sample of New South Wales credit unions over the period 1987 to 1997.

The nonprofit organisational literature is critically examined, and the proposition that the nondistribution constraint is the essential feature in overcoming information problems is rejected. Instead, it is argued that nonprofit organisations have comparative advantages in the use of non-market mechanisms to address agency problems, using altruism, relationships of trust, and manager screening and socialisation. The mutual structure can be explained in terms of addressing information asymmetry between producers and consumers by creating a coalition of interest. This argument is also supported within a transaction cost economics framework, by analogy to the concept of a peer group.

In examining intermediaries and insurers, financial economics generally finds that mutual institutions are inherently inefficient, relative to shareholder-owned corporations, based on lack of clarity in the definition of property rights and access to market discipline. The advantage of mutual financial institutions is, however, in the lower agency costs of debt through the alignment of depositor/policyholder interests. This reduces the incentive for owners to engage in wealth transfer through increasing portfolio risk. More importantly, mutual institutions should

have comparative advantages in credit and insurance markets, where severe problems of adverse selection and moral hazard exist. The development of mutual forms of intermediary supports this perspective. An economic model of credit union behaviour is proposed, based on the importance of the common bond of association in ameliorating manager self-interest.

An examination of Australian credit union regulation is conducted, revealing a trend away from institutional forms of regulation in favour of a policy of competitive neutrality. The major legislative development in the 1992 uniform Scheme is the imposition of a risk-weighted capital adequacy requirement, drawn from international banking practice, but arguably inappropriate to the mutual organisation structure of credit unions, reflecting a failure by regulators to appreciate important institutional differences. Likely consequences of this measure include: profitability as the principal operating objective; accumulation of surpluses; increased preference for residential mortgage lending; constraints of growth; demutualisation and merger behaviour to address capital problems; and increased compliance costs for smaller credit unions.

These predictions are assessed empirically, using a sample of 150 credit unions over the period 1987 to 1997. Box-Tiao style intervention and trend analyses are performed on each of the institutions, together with cross-sectional regressions of the estimated responses. The results show that credit unions typically responded to the capital requirement by emphasising lower-risk housing loans, reducing profitability (from reduced interest margins and greater competition from other institutions). Consistent with theoretical expectations, the response of credit unions is found to be a function of initial capital levels, the common bond, and institution size (a proxy for member bonding).

Contents

Chapter One
Overview

Credit unions are not "banks in disguise" (Bundt, Chiesa and Keating, 1989). They traditionally represent a cooperative form of organisation steeped in the history of the credit union "movement" and principles of self-help.[1] The social aspect of these institutions supports an important economic advantage - addressing severe problems of information asymmetry through non-market mechanisms. In particular, the characteristics of mutuality and the common bond of association provide comparative institutional advantages in dealing with adverse selection and moral hazard facing credit markets, and ameliorating manager self-interest in the absence of market incentives. Recent regulatory changes to the Australian industry, through the Financial Institutions Scheme, assume that mutuality is outdated. The impact of the Scheme on credit unions is studied within an economic theory explaining their institutional differences, and assessed using empirical evidence.

1 For detailed histories of the credit union movement, see Wolff, 1910; Giles, 1951; Dublin, 1966; and Moody and Fite, 1971.

1.1 Objectives

There are three principal objectives. The first is to develop an economic theory of credit unions[2] that explains the importance of the institutional differences of mutuality and the common bond of association. Part of this theoretical development involves a critical analysis of the literature on nonprofit organisations, and an application of transaction cost economics in explaining the role of mutuality in overcoming information asymmetry and promoting altruistic behaviour. It is argued that a credit union can be explained in terms of comparative institutional advantage in dealing with problems of adverse selection and moral hazard within financial intermediation.

The second objective is to analyse the regulatory changes introduced by the Financial Institutions Scheme within the context of this economic model, in order to assess the likely impact of the Scheme on credit unions. This is based on a detailed comparison of credit union legislation prior to the Scheme against the new regulatory framework. The imposition of a capital adequacy requirement, reflecting the extension of Reserve Bank style prudential mechanisms, is identified as the major source of conflict with credit union operating principles, challenging the mutuality characteristic and eroding the usefulness of the common bond.

2 A useful definition is: "A democratically-controlled voluntary co-operative society of individuals, bound together by a common bond for the pursuit of the economic welfare of members through the receipt of funds from members and others, and the provision of loans and other forms of credit and financial services to members" (Crapp and Skully, 1985).

The imposition is explained as a failure by regulators to appreciate institutional differences, in the pursuit of a policy of competitive neutrality.

The third objective is to test the predicted effects of the Scheme on credit union behaviour. Statistical analysis is conducted on a sample of 150 credit unions in New South Wales using quarterly financial data over the period 1987 to 1997. Intervention analysis, trend analysis and cross-sectional regression models are used. The results demonstrate that the regulation produced changes in credit union behaviour consistent with theoretical expectations.

1.2 Structure

Chapter Two critically reviews the economic literature on nonprofit organisations, to assess whether the nonprofit characteristic of the credit union is its important feature. The organisation is understood to emerge in response to contract failure from information asymmetries. A common assumption that the nondistribution constraint overcomes these information problems is disputed. Agency theory would view the constraint as an insulation of the organisation from the effect of market discipline, leading to inefficiencies. Instead, it is argued that nonprofit organisations have comparative advantages in the use of non-market mechanisms to address agency problems, using altruism, relationships of trust, and manager screening and socialisation. Information asymmetry problems are reduced by the coalition of producer and consumer interests

through mutuality. This analysis is supported by transaction cost economics, where internal organisation of transactions is a rational response to information problems.

Chapter Three critically reviews the literature dealing with mutual financial institutions. Agency theory finds such organisations inherently inefficient due to the difficulties in using market mechanisms to discipline managers. This literature speculates that favourable regulation, separation of decision management and control through hierarchies and outside directors, and particularly redeemable member claims, support the continued existence of mutual institutions. A better perspective of principal-agent conflicts is found in the identity between owners and depositors/policyholders within a mutual, reducing the incentive of owners to increase risk at the expense of debtholders. In addition, the insulation of managers from market discipline implies risk-averse behaviour and prudence in adoption of an investment portfolio. As an alternative to agency theory, an informational perspective argues that financial mutuals have comparative advantages in credit and insurance markets due to the presence of severe problems of adverse selection and moral hazard. Screening and monitoring to address such information asymmetries is enhanced within mutual organisations, where relationships of trust promote information flows and social sanctions for delinquency. The history of German banking cooperatives, mutual banks and savings and loan associations in the Untied States demonstrates this informational role. This suggests an economic model of credit union

behaviour based on the importance of the common bond of association in ameliorating manager utility maximisation.

Chapter Four provides a detailed analysis of the legislative changes introduced by the Financial Institutions Scheme, arguing that credit union regulation is driven principally by the policy objective of competitive neutrality. Public policy since the Campbell Inquiry increasingly emphasises the similarities between financial institutions, with the consequence that prudential rules applicable to banks are extended to all forms of deposit-taking institutions. While the State-based uniform system eliminates previous interstate distortions and emphasises a number of mutual and cooperative principles, the major regulatory development is the imposition of a risk-weighted capital adequacy requirement, adapted from the supervision strategy of the Reserve Bank.

Chapter Five assesses the theoretical impact of the Scheme within the context of the model of credit union behaviour developed earlier. Capital adequacy rules are incompatible with the institutional structure of a credit union, failing to appreciate important institutional differences. In particular, assumptions of excessive risk-taking behaviour and the ability to issue permanent equity, underlying the use of regulatory capital, are inappropriate. The mandate to increase reserves through profitability is also likely to undermine the cooperative foundations of the credit union. The Scheme is expected to result in changed institutional behaviour. Credit unions must seek a target rate of return to maintain capital

adequacy when faced with growth opportunities, potentially shifting management emphasis from maximising member benefits to maximising surpluses. Incentives to judge performance by corporate sector measures may also undermine the common bond's ability to address agency problems. The continued accumulation of surpluses with vague ownership rights will prompt moves to demutualisation to expropriate the communal wealth for the benefit of the current stakeholders. Pressure to meet capital requirements is also likely to result in an increased preference for residential mortgage lending in portfolio choices, given their lower risk weighting. Personal loans are, however, the traditional area of activity for credit unions which draws upon their comparative informational advantages. Smaller credit unions may be affected adversely by cost increases through supervision levies, and the complexities of addressing banking style prudential requirements. The traditional administration of small cooperatives by the members themselves would be discouraged. Merger activity is expected, as a mechanism to address growth, liquidity and compliance problems.

Chapter Six provides a review of the empirical literature on credit unions, which can broadly be classified into studies on industry structure, scale economies, and organisational behaviour. The common bond is shown to be an important component of some studies in each of these areas. Intervention analysis, particularly in terms of a Box-Tiao time series approach, is introduced. The usefulness of this technique, adopted in part by the empirical analysis in Chapter Seven, is in assessing the impact of

regulatory changes. The literature on regulatory changes using various forms of intervention analysis is also reviewed.

Chapter Seven presents the results of an empirical investigation of the impact of the Financial Institutions Scheme on credit union behaviour. The impact is assessed using quarterly financial information on a sample of 150 credit unions in New South Wales over the period 1987 to 1997. Three sets of analyses are conducted. First is an intervention analysis of the time series of accumulated reserves for each institution, to assess the hypothesis of an increased emphasis on profitability to meet capital requirements. The second is a post-intervention trend analysis of the proportion of housing loans to evaluate the prediction that residential mortgage lending would be emphasised given its lower risk weighting. Finally, the institutional responses are explained by a cross-sectional regression including levels of regulatory capital, common bond and size (a proxy for common bond effectiveness). The results show that the Scheme did have an impact on credit union behaviour consistent with the theoretical expectations.

Chapter Eight concludes the thesis by reviewing its content, identifying the significant contributions, and considering the future of credit unions given the recent Wallis Inquiry, and the future transfer of the Scheme to a single national prudential regulator for all financial institutions.

Chapter Two
Nonprofit Organisations

The focus of this thesis is the economic nature of credit unions as an institutional form and the impact of regulation on credit unions within this context. Credit unions are a type of nonprofit organisation. An initial question is whether the nonprofit characteristic of the credit union is the essential institutional feature. A nonprofit organisation is defined as one that is prohibited, either by legislation or by its own corporate constitution, from distributing its net surplus to its members. This is known as the "nondistribution constraint" (Hansmann, 1980, p. 838). This chapter critically reviews the economic literature on nonprofit organisations, and rejects the widespread assumption that the nondistribution constraint overcomes information asymmetry problems. Rather, the feature of interest is the integration of producer and consumer interests within a single organisation, capturing positive information externalities. The conclusion is that mutual organisations have a comparative advantage in effecting transactions that are subject to significant problems of information asymmetry between producer and consumer.

The chapter begins with an overview of the information asymmetry explanation for nonprofit organisations. It then disputes, as misplaced,

the emphasis on the nondistribution constraint as the critical element in generating trust between producer and consumer. Moreover, the nondistribution constraint suggests serious agency problems due to the absence of market-based disciplining mechanisms. These agency problems are addressed by altruistic behaviour, which is based either on the ideological nature of the nonprofit organisation or in the integration of producer and consumer interests through mutuality.

It is suggested that the institutional structure of a mutual organisation reduces information asymmetries by encouraging information flows, and attenuating opportunism through altruistic social pressures. This argument is supported by transaction cost economics, in that internal rather than market governance of transactions in the presence of information impactedness is desirable.

2.1 Information Asymmetry

Nonprofit organisational literature cites information asymmetry between producers and consumers as the principal reason for the emergence of such an institution. Assumptions representing the conditions for an efficient market include assumed abilities of consumers to choose rationally between products and prices offered by different firms, then to negotiate and to monitor a contract with the chosen firm (Hansmann, 1980, p. 843). For common physical goods such food and household products this assumption will be justified. In more specialised situations it will be inappropriate, due to the nature of the product itself, or the

related contract bargaining process and enforcement mechanisms.

2.1.1 Adverse selection and moral hazard

The problems of adverse selection (Akerlof, 1970) and moral hazard are important. Both these concepts can be illustrated by the insurance contract. The premium quoted by an insurance company will be based on an estimate of the probability of the particular event occurring - the "insured risk". The information used by an insurer to calculate this risk is limited and therefore the insurer is unable to distinguish between degrees of risk. The adverse selection problem is manifest in the terms of an insurance contract being more attractive, for example, to those of poor health who are therefore more likely to apply for cover. Moral hazard arises where the effect of the insurance is to induce the actor to take fewer precautions (Arrow, 1962; Demsetz, 1969). There will be less incentive, for example, for a householder to ensure doors are locked and a security system activated.

2.1.2 Contract failure

In some commercial contracts other than insurance, potential adverse selection and moral hazard problems favour profit-seeking firms. These information asymmetries are compounded with dishonesty, difficult to observe quality variations and informationally weak consumers (Akerlof, 1970; Leland, 1979; Stuart, 1981; Ben-Ner, 1986, p. 96). The producer then has a degree of market power that can be exercised for the benefit of the

producer and the detriment of the consumer. Hansmann (1980) argues that in such a situation consumer welfare is increased by dealing with a producer who does not have the same incentives to maximise profit (p. 844):

> The nonprofit producer, like its for-profit counterpart, has the capacity to raise prices and cut quality . . . without much fear of consumer reprisal; however, it lacks the incentive to do so because those in charge are barred from taking home any resulting profits.

On this basis, contract failure is the essential factor in the role of nonprofit enterprise. Nonprofit organisations can be "trusted" not to exploit their advantage over consumers, due to legal constraints (Thompson, 1980; Ellman, 1982; Hansmann, 1987). Weisbrod states (1988, p. 23, emphasis in original):

> [J]ust as there is often an advantage to doing business with a specific individual seller, so there can be an advantage to dealing with a specific *kind* of seller. Relationships of trust - "loyalty" - are central to many of our social and economic relations.

This "contract failure" argument explains nonprofit organisations as a response to information asymmetry: the nondistribution constraint provides an effective means to prevent exploitation of information advantage (Weisbrod, 1988). Consumers "trust" the nonprofit producer where quality of output is difficult or costly to observe.

This information asymmetry analysis has been applied to blood banks, nursing homes, medicare payments, and religious organisations. Frequently cited are services such as education and health care (Arrow,

1963) where the customers have inadequate information about the product with which to measure quality. Supporting the development of nonprofit service organisations is dissatisfaction with government provision of collective goods (Weisbrod, 1977). Government may also be seen as a "trustworthy" supplier of services as it shares a nonprofit motive, but informational problems between politicians and consumers, or simply incompatible political objectives, may lead to an undersupply of some services. This provides a niche for nonprofit organisations to develop alternative or additional supplies. Indeed, Badelt (1990, p. 57) describes the interplay of an "institutional triangle" of private market organisations, government organisations, and private nonprofit organisations. Nonprofit organisations supplement the public provision of collective consumption goods, and provide an alternative for private sector substitutes (Weisbrod, 1986, p. 30).

Weisbrod and Schlesinger (1986) provide evidence in a study of nursing homes in Wisconsin supporting the contract failure hypothesis. Under contract failure theory, private sector firms provide superior delivery of outputs which are readily monitored and enforced within a contract ("Type I attributes"), while nonprofit organisations deviate less from promised quality in respect of outputs which are costly to monitor ("Type II attributes"). Deviations from Type I attributes are measured by regulatory violations, on the basis that the administrative requirements are formal and readily monitored minimum standards. Complaints lodged with regulators (other than in respect of regulatory violations) are

taken as a proxy for deviations from Type II attributes. This proxy is justified on the basis that breaches of performance too costly to monitor would not be found in the regulations but would be detected by patients and family members. The results of regression analysis indicated that nonprofit homes have significantly fewer complaints than did the for-profit homes. This finding is consistent with the hypothesis that for-profit firms do take more advantage of information asymmetry.

2.1.3 The nondistribution constraint

While the role of information asymmetry in the formation of nonprofit organisations is clear, reliance on the nondistribution constraint as the *essential* feature in addressing the information problems is unconvincing. Statements such as the following are typical (Hansmann, 1980, p. 896):

> [N]onprofits can be trusted not to exploit the advantage over the consumer resulting from contract failure. This trust derives its rational basis from the nondistribution constraint that characterises the nonprofit form.

Hence, nonprofit producers lack incentives to raise prices or reduce quality "because" of the nondistribution constraint. The nondistribution constraint automatically translates into a normative mandate of an altruistic kind, such as a "legal commitment to devote its entire earnings to the production of services" (Hansmann, 1980, p. 844). Easley and O'Hara (1983, 1986) argue, for example, that nonprofit organisations are a superior contracting solution to for-profit firms where the quality of the

output cannot be costlessly observed. They view society and the firm as playing a non-cooperative game in which the manager maximises personal utility while society maximises social welfare. The nondistribution constraint within nonprofit organisations is consistent with the achievement of an optimal contract, if output cannot costlessly be observed (Harris and Townsend, 1981; Easley and O'Hara, 1986, pp. 89-90). The problem, however, is that their analysis formalises the nondistribution constraint by fixing the level of managerial reward to be independent of the state of nature. Given this definition, the absence of an incentive to distort information is an assumption, not a conclusion (Rose-Ackerman, 1986, p. 6).

The argument that the comparative advantage of nonprofit organisations lies in the nondistribution constraint is unsatisfactory. One problem is that the nondistribution constraint implies isolation from market forces, leading to a comparative *disadvantage* in terms of operating efficiency. Young (1986) notes that while theories explaining the existence of nonprofits attribute "a selfless, public spirited quality" to them (p. 161), economic models of nonprofit behaviour instead suggest revenue enhancing or other self-seeking objectives on the part of management (James, 1983; Pauly and Redisch, 1973; Rose-Ackerman, 1980). This is a problem of agency costs, discussed in section 2.2. Another difficulty is a confusion of cause and effect - altruistic behaviour is assumed to derive from the nondistribution constraint. It is more likely, however, that the nondistribution constraint is a product of altruistic behaviour, which

flows from other institutional features. The issue of altruistic behaviour is discussed in section 2.3.

2.2 Agency Problems

In the absence of disciplining market-based incentives, financial economics suggests that a nonprofit organisation will suffer from significant shirking behaviour by managers. The nondistribution constraint, together with other features of nonprofit governance, insulate the nonprofit organisation from market forces. The governance structures of nonprofit organisations encourage shirking or permit managers to cross-subsidise goods by various ploys, deteriorating the quality of another (James, 1978, 1986b; James and Neuberger, 1981). Nonprofit operations are therefore likely to be less efficient than are for-profit firms (James, 1990, p. 22; Leibenstein, 1966; Steinberg, 1986).

2.2.1 Agency costs of equity and debt

A major development within the financial economics literature has been labelled "agency theory". It examines the rights of contracting parties within an organisation and the effects on manager and owner behaviour (Alchian and Demsetz, 1972). The foundation for much agency literature derives from Jensen and Meckling (1976), who integrate elements of economic theories of principal-agent (Berhold, 1971; Heckerman, 1975 Ross, 1973, 1974; Wilson, 1968), property rights (Demsetz, 1967; Alchian, 1969; Alchian and Demsetz, 1972) and finance to develop a theory of firm ownership structure. Jensen and Meckling (1976) analyse the agency costs

of outside equity starting with the owner-manager scenario where all of the firm's equity is held by a single individual. Maximising personal utility implies an objective other than value maximisation of the firm, since part of the utility flows from the consumption of "perquisites".[3] If equity is sold to third parties, the incentive of the owner-manager would be to increase the consumption of perquisites since the owner-manager no longer bears the full cost of its impact on firm value. This incentive increases with the proportion of equity sold to third parties. Yet, assuming an efficient equity market characterised by rational expectations regarding the owner-manager's behaviour, potential purchasers of equity in the firm apply a discount. This discount is based on an expectation of the changed owner-manager's incentives to consume perquisites or otherwise shirk. This "price protection" mechanism ensures that the owner-manager (the agent) bears the full cost of divergence from the value maximisation objectives of the shareholders (the principals). In this situation, the owner-manager would have an incentive to restrict shirking behaviour, aligning personal objectives to value maximisation.

Extending this analysis to the agency costs of debt, there is a potential divergence between the interests of the shareholders (including the

3 Jensen and Meckling (1976, p. 312) "perquisites" might include "the physical appointments of the office, the attractiveness of the secretarial staff, the level of employee discipline, the kind and amount of charitable donations, personal relations with employees [and] a larger than optimal computer to play with," or as Rasmussen (1988, p. 399) more concisely stated, "fringe benefits, pleasant working conditions, nepotism, and a low managerial effort".

manager-shareholder) and debtholders, principally arising from the legal privilege of limited liability. At worst, the shareholders could directly expropriate the wealth of the company through excessive dividend payments, leaving creditors with an "empty shell". The value of debt can also be eroded by issue of new debt at equal or higher priority (Galai and Masulis, 1976). Generally, an incentive of the manager-shareholder issuing debt is to engage in more risky investments with potentially large returns. The manager-shareholder would capture the benefits of a successful venture (since the debtholder is limited to an interest rate return) while the debtholder would bear most of the cost of failure. Shareholders can therefore be viewed as holding a European call option (Black and Scholes, 1973) over the value of the firm exercisable at the face value of the debt. Increasing the risk (variance) of the firm's investments leads to a higher value for this option (Merton, 1973, 1974). This can lead to "asset substitution" and "underinvestment" behaviour. Shareholders might substitute high risk for low risk projects (Myers, 1977) or reject positive net present value investments whose benefits would accrue principally to debtholders (Barnea, Haugen and Senbet, 1985).

Again, the rational expectations of the lenders and an efficient market can facilitate price protection mechanisms. Potential lenders (the principals) will raise the price of the debt (e.g. by higher interest rates) according to the changed incentives of the shareholders (the agents) with respect to the risk and return of the firm's investments. This ensures that the shareholders bear the cost of a divergence from the interests of the

lenders. The agents then have an incentive to write contracts that to align their interests with the debtholders, such as voluntarily imposing dividend constraints, limits on future debt issues of equal or higher priority, and maintenance of working capital. Smith and Warner (1979) demonstrate that debt covenants restrict management's financing, dividend and investment decisions, consistent with an intention to limit the opportunity for wealth transfers.

2.2.2 Disciplining mechanisms

While the Berle and Means (1932) thesis suggests a serious divergence between shareholders and management, agency theory literature extending Jensen and Meckling (1976) finds that the actions of shareholders exercising their limited rights, in conjunction with the sharemarket and the market for corporate control align their interests (Hetherington, 1969a). These disciplining mechanisms rely for their effectiveness on the operation of an efficient market for equity, labour, or corporate control. This efficiency is typically assumed (Fama, 1976). Easterbrook and Fischel (1983, p. 397) state:

> Shareholders' interests are protected not by voting but by the market for stock (and the managers' need to raise new capital), the market for goods, and the market for managers' services. It would make little difference if shareholders, like bondholders, could not vote at all.

The disciplining effect of price protection from an efficient equity market on the actions of an owner-manager is analysed in Jensen and Meckling (1976). Where, however, the manager is no longer a part owner but

simply a professional manager with limited financial interest in the firm, this price protection mechanism no longer applies directly. Instead, management compensation plans will substitute for this discipline. Such plans are contracts which reward the manager based on market-related measures of performance, including accounting income and share options (Smith and Watts, 1982). Evidence of share price reactions to announcement of such packages suggests that they help align managers' and shareholders' interests (Jensen and Zimmerman, 1985). The incentives of managers are thereby indirectly related to the price protection mechanism due to the indirect relationships between bonuses, and accounting performance to firm value (Watts and Zimmerman, 1986, p. 203; Wong, 1988, p. 24).

Another disciplining mechanism to align managers' and shareholders' interests is a competitive labour market. Information on managers' opportunistic behaviour affects their reputation (Fama, 1980). This is partly based on a process of mutual monitoring of managers by other managers within a firm's hierarchy. The manager's future salary will reflect past performance and create an *ex post* settling up opportunity. Some argue that this scenario and that of compensation plans are incompatible (Holthausen, 1981; Dhaliwal, Salamon and Smith, 1982). Others believe disciplining mechanisms can act in a complementary fashion (Wong, 1988, p. 25).

The market for corporate control - the threat of a takeover or merger

(Manne, 1965) - acts as a disciplining mechanism "of last resort" (Fama, 1980, p. 295). When alternative management teams actively compete for the rights to manage corporate resources, managers have incentives to adhere to value-maximising strategies (Jensen and Ruback, 1983).

2.2.3 Nonprofit organisations

Applying agency theory to the nonprofit organisation, the nondistribution constraint is inefficient since property rights are not clearly defined in respect of organisational surpluses (Weisbrod and Schlesinger, 1986, p. 134; De Alessi, 1980). Due to the institutional restriction on profit seeking, nonprofit managers cannot capture the value of any improved efficiencies, so lack the incentive to ensure a level of efficiency comparable to the private sector (Newhouse, 1970). This might also be reflected in a general lack of sensitivity to the economic environment (Young and Finch, 1977). According to Alchian and Demsetz (1972):

> [I]n nonprofit corporations, colleges, churches, country clubs, mutual savings banks, mutual insurance companies, and 'coops', the future consequences of improved management are not capitalized . . . One should, therefore, find greater shirking in nonprofit, mutually owned enterprises.

Nicols (1972) believes that, given the lack of supervision by shareholders, managers of mutual banks are unlikely to minimise costs of banking services. This is exacerbated where the governance structure of the nonprofit organisation is based on democratic principles of one-member-one-vote and the equity is represented by the membership of natural

persons rather than by shares. Without a tradeable share capital, nonprofit organisations cannot be monitored by the operation of the capital markets, whether by institutional investors, significant blockholders or by analysts. This characteristic implies that access to instruments for the discipline of managers that rely on a public equity, such as monitoring by institutional shareholders, managerial equity ownership, incentive contracts, share options and takeovers, is considerably restricted. The formation of competing control coalitions within nonprofit organisations is also less likely since the takeover mechanism is often unavailable, and a proxy fight would be more expensive. In many nonprofit organisations, additional voting power cannot be aggregated by purchase of shares, and is dispersed widely among individuals. On this basis, managers of nonprofit associations are said to be effectively self-controlling, limited only by government intervention (Rasmusen, 1988). Hetherington (1969b, p. 1083) states:

> The practice in both property-liability and life companies plainly reflects the almost total nonparticipation of policyholders in the selection of management.

These findings are supported by Kreider (1972) in respect of mutual insurance and banking, although disputed by Anderson (1973). Nicols (1967, p. 337) describes the management of one mutual savings and loan association as "a self-perpetuating autocracy" and documents evidence of widespread nepotism within the industry.

The agency problems discussed in this section provide a counter-

argument to the assertion that the nondistribution constraint creates a comparative advantage for nonprofit organisations. In contrast, financial economics suggests that the constraint is a disadvantage in terms of operating efficiency. This reinforces the argument that other institutional features are responsible for dealing with information asymmetry, and with the problems of managerial motivation where the organisation is insulated from market forces. This leads to the issue of observed altruistic behaviour in nonprofit organisations, discussed in the following section.

2.3 Altruism

The serious efficiency concerns in respect of nonprofit organisations outlined above prompts the question: how do nonprofit organisations survive in a competitive economy (Eggertsson, 1990, p. 142)? Information asymmetry alone provides an unsatisfying explanation for the continued survival of nonprofit organisations given significant problems of management control in some nonprofit firms (Easley and O'Hara, 1983; Hansmann, 1980). If market discipline is one mechanism by which principal-agent problems can be overcome, the issue is then which *non-market* mechanisms are suitable for the same purpose. In this section, it is argued that emergent within nonprofit institutions are non-market mechanisms to reduce shirking and promote efficiency.

2.3.1 Social cooperation

Concepts of trust and altruism do not sit easily within the self-interested assumptions of the preceding agency framework. Yet as James and Rose-Ackerman (1986, p. 92) observe:

> As in the analysis of bureaucracies and for-profit firms, agency-principal problems are at the heart of the analysis of NPO behaviour and one's evaluation of the performance of the sector frequently depends on whose point of view one takes. What one person views as inefficient, self-indulgent or diverse behaviour by NPO managers, another views as socially beneficial, admirably generous or a reflection of the ideological diversity of the population.

The argument that the social interactions within nonprofit organisations promote cooperative behaviour is supported by some economists. Arrow (1971, 1973, 1974) has consistently argued that trust has an important bearing on economic organisation. "Invisible institutions" of ethics and morality support collective action and the allocation of resources through non-market methods. The fact that individuals cannot mediate all their interactions with others through prices makes it essential that they have a "conscience", or a feeling of responsibility for the effect of their actions on others (Arrow, 1974, pp. 26-27). Altruism is therefore inherent within much observed economic behaviour (Collard, 1978), such as through widespread traits of pride in work and organisational loyalty (Simon, 1991). Behavioural norms or ethical rules are essential in constraining opportunism and "lubricating" social and economic systems (Noreen, 1988).

One theory of altruistic behaviour is that of social distance. Altruistic behaviour is more likely between "kin" than others in society, suggesting a genetic imperative or "selfish gene" explanation (Dawkins, 1976; Trivers, 1971; Kropotkin, 1972). More generally it has been recognised that beyond families, human beings develop complex social relationships with colleagues and neighbours such that allowances are made for how their own economic behaviour will affect these others and affect the state of the social relationship (Becker, 1974, 1976; Hirshleifer, 1977). Collard (1978, pp. 13-15) argues that altruism facilitates cooperative or collective economic behaviour. Based on a prisoner's dilemma analysis, spontaneous cooperation is found to be more likely: the more altruistic the players; the smaller the number of players (Schumacher, 1974); the greater the advantage of cooperation relative to defection; and the greater the marginal impact of the individual (Collard, 1978, pp. 36-45). Importantly, it is more likely that voluntary social cooperation will exist in a smaller community than a larger community, supported by social relationships and the scope for applying the "stick" of social pressure (Weisbrod, 1988, p. 28; McKean, 1975, p. 35; Buchanan, 1965). Continuing exchanges are overlaid with social content, generating strong expectations of trust and attenuating opportunism (Granovetter, 1985, p. 490).

Social learning provides an understanding of both skills and "proper behaviours". Nurturing of these behaviours and the cultivation of an acceptance of social norms leads to an exploitation of altruism which can be manifest in loyalties to organisations and organisational goals wholly

disproportionate to the material rewards individuals receive (Simon, 1990). Such social norms, however, do not "reinforce" (Hansmann, 1980, p. 875) the nondistribution constraint. Instead, the absence of a profit making incentive flows from the social norms otherwise embedded in the institution. Altruism also explains apparently "inefficient" forms of governance within a range of nonprofit organisations. Collard (1978) notes that a feature of altruistic behaviour is the development of a social contract to compel adoption of cooperative strategies, typically based on majority voting within a democratic system of community governance (pp. 15-16). This social contract can be seen as based on widespread agreement on the desirability of everyday decisions using this decision process, given an expectation of the preference patterns of other individuals (Arrow, 1951, pp. 90-91).

2.3.2 Managerial motivation

The social norms generated within the nonprofit organisation are also important in motivating management in the absence of pecuniary forms of reward linked, for example, to capital markets. Instead, non-market mechanisms can be used as alternative sources of incentives and sanctions for members of nonprofit organisations. Where workers in a nonprofit organisation can participate in the successful achievement of charitable or public objectives, they will be motivated by a mutual interest in the collective result (Ricketts, 1994, pp. 308-309).

If managers of nonprofit organisations derive relatively greater personal

satisfaction than private sector counterparts from the achievement of social objectives, there may be sufficient incentive to pursue efficiencies in the absence of market-based economic rewards and disciplining mechanisms comparable to the private sector (Weisbrod, 1988, p. 23). Indeed, a nonprofit organisation will have a comparative advantage in provision of nonpecuniary rewards; it may place a higher value on embedded characteristics, such as honesty, than a for-profit firm. This assumes a heterogeneous distribution of motivating preferences amongst potential managers, with some placing a higher value on nonpecuniary rewards than others (Weisbrod and Schlesinger, 1986).

On this basis, nonprofit organisations will screen for a particular type of person ("managerial sorting": Weisbrod, 1988) who gains satisfaction from the achievement of the organisation's objectives and the provision of services of high quality. Support for this hypothesis is found in psychological studies of graduates of Vanderbilt University entering the for-profit and nonprofit sectors (Rawls, Ullrich and Nelson, 1975). Significant differences were consistently found in personality traits, values and behaviour, but not in problem solving ability, intelligence or creativity. Similar evidence of screening is found in studies of law school graduates entering proprietary or "public interest" firms. Those working for the public interest firms were earning less than they would in private practice (and were aware of it), yet were significantly more satisfied with their career choices than private sector counterparts. Their satisfaction was based on the attractiveness of the social objectives within their work

(Weisbrod, 1983).

2.3.3 Ethical and mutual nonprofit organisations

Altruistic social norms within nonprofit organisations, in preference to the nondistribution constraint, directly address information asymmetries and provide scope for nonpecuniary forms of reward to motivate managers in the absence of market-based incentives. The institutional features by which these social norms, or relationships of trust, are created vary across different types of nonprofit organisation. An attempt, however, to apply a general rule to all forms of nonprofit organisation would be inappropriate, given the wide range of organisations which might be identified under this heading. Part of the problem is an undue emphasis on the nondistribution constraint as the essential feature.

At this point, it is useful to divide nonprofit institutions into two broad categories that, for the sake of convenience, are labelled "ethical" and "mutual". The former category is characterised by a membership with strongly embedded social norms or the explicit founding of the organisation to serve particular social objectives. James and Rose-Ackerman (1986, pp. 50-62) emphasise that one factor crucial to the formation and existence of nonprofit organisations was "ideology", beliefs motivating behaviour in the absence of pecuniary rewards. Studies of social service industry managers in the United States suggest that nonprofit organisations are founded to pursue nonpecuniary goals, such as the provision of services rather than profitability (Young, 1983;

Legoretta and Young, 1986). International studies conclude that nonprofit organisations are typically "ideological" organisations, in the sense of religious or political groups (James, 1982, 1984, 1987). Religious groups in particular often provide organisational ability, venture capital, and volunteer labour. The ethics underpinning these organisations provide a comparative advantage in the provision of services where for-profit firms might exploit informationally weak consumers, such as in the case of nursing homes. The belief system embedded in the institution's values also provides nonpecuniary rewards to individuals who identify with the organisation's objectives. Empirical findings that religious and government affiliated nursing homes had fewer regulatory violations than other nonprofit providers, and no more violations than for-profit counterparts, suggest that religious and government managers are less motivated by financial incentives (Weisbrod and Schlesinger, 1986, pp. 142-143).

The latter category of "mutual" nonprofit organisations is of principal interest to the issue of credit unions. Mutual institutions can be identified more closely with problems of information asymmetry, given the explicit integration of producer and consumer interests. In this situation, the "trust" between consumer and nonprofit producer does not flow from a nondistribution constraint or directly from an embedded ethical system, but by a coalition of interest (Ben-Ner, 1986, p. 94):

> If the [producer and consumer] are integrated . . . the antagonistic relations between them will be eliminated, all

> gains are internalized, and the incentives to withhold information and exploit special advantages disappear. The integrating party obtains information that cannot be transmitted on the anonymous market and requires the organization to maximise joint surplus.

As Weisbrod and Schlesinger (1986, p. 147) observe, trust is an informational phenomenon. Trust between organisational members is likely to yield significant informational benefits both to individuals and to an organisation as a whole (Ross, 1994). Ben-Ner (1986) argues that the benefit of mutual nonprofit organisations can be found in the inducement of consumer demand revelation and the elimination of the incentive to exploit informational advantage. This implies a comparative advantage for the mutual nonprofit organisation where information asymmetry problems are severe. The consumer forms a social relationship with the producer through the nonprofit institution, which prevents the destruction of community through the intervention of the market.

The costs of formation and operation of a mutual nonprofit organisation are reduced by a correlation between the consumers' interest in the institution and their residential, cultural, ethnic, religious or political backgrounds. In turn, this affinity generates social cohesion, which enhances demand revelation and voluntary contributions (Ben-Ner, 1986, p. 108). The smaller the size of this group the more feasible this mechanism becomes (Olson, 1971; Groves and Ledyard, 1977). Mutual nonprofit organisations are therefore more likely to be formed where the output has public good characteristics, and where the output is localised

within a community. This reinforces the community of interest between the potential members of the organisation, consistent with the earlier discussion of voluntary social cooperation. Managerial motivation derives from the enhancement of the interests of this local community, based on the expectation that managers are more likely to be selected from this same group of consumers.

The following section draws on transaction cost economics to support this theoretical interpretation of mutual nonprofit organisations, using the analogy of non-market governance arrangements as a mechanism for dealing with questions of information asymmetry.

2.4 Transaction Cost Economics

The previous section argues that mutuality, rather than a nondistribution constraint, is the essential characteristic of nonprofit organisations where the organisation emerges in response to information asymmetries between producer and consumer. Mutual organisations, such as a credit union, integrate producer and consumer interests. Credit unions as mutual financial institutions are discussed in Chapter Three. This section analyses mutual nonprofit organisations from the perspective of transaction costs economics, a subset of "neoinstitutionalism" or the "New Institutional Economics", and finds support for the arguments presented in the section 2.3.

Neoinstitutionalism draws on microeconomic theory, economic history, property rights theory and a focus on transactions as the basic unit of

analysis to study organisations (Williamson, 1975, 1985; see also Alchian and Demsetz, 1972, 1973; Arrow, 1974; Davis and North, 1971; Ward, 1971), and has its origins in pioneering work by Commons (1934), Coase (1937) and Hayek (1945). These authors emphasise the facilitation of collective action through institutions, the substitution of market contracts with employment relationships, and the effect of bounded rationality - limits on human decision making due to lack of complete information. In particular, economic man acts "within constraints imposed by real institutions" (Coase, 1984, p. 231).

2.4.1 Transaction costs and contracting

Transaction costs are regarded as the economic equivalence of friction in physical systems (Williamson, 1985, p. 19). Transaction costs include costs that are incurred in preparing and monitoring economic transactions. Differences in these transaction costs determine institutional choices. Where there are no transaction costs, there is no need for a form of organisation. *Ex ante* contracting costs include drafting, negotiating, and safeguarding an agreement. *Ex post* contracting costs include costs of haggling over bilateral negotiations to correct misalignments of interest; set-up and maintenance costs of a governance structure; and bonding costs of effecting secure commitments. These *ex post* costs are seen by Williamson (1985, p. 21, fn. 12) as related to, but distinct from, agency costs in the Jensen and Meckling (1976) sense. Williamson (1985, p. 27) notes that the assumptions of price protection within agency theory suggest a

contracting view which emphasises *ex ante* incentive alignments with little uncertainty about future contingencies. Uncertainty generates costs in contracting due to the need to provide for complex factual contingencies and due to the scope of opportunistic behaviour when unplanned contingencies occur. Both kinds of costs are interrelated and need to be addressed simultaneously within any contracting situation, and are compared on the basis of relative costs of institutional forms. Transaction cost economics adds to ownership (property rights) and incentive alignment (agency) perspectives the proposition that *ex post* support institutions of contract matter (Williamson, 1985, p. 29).

Williamson (1985, pp. 30-32) discusses three essential factors from which an optimal contracting approach can be derived. These are bounded rationality, opportunism, and asset specificity. Bounded rationality refers to human behaviour that is "intendedly rational, but only limitedly so" (Williamson, 1975, p. 21; Simon, 1957, 1961, p. xxiv). Bounded rationality includes biological limits on human understanding and language difficulties, which becomes important under conditions of uncertainty or complexity (Ricketts, 1991). The implication for contracting is that, where bounded rationality is combined with uncertainty or complexity, a set of contingent expectations cannot be specified *ex ante*. One implication is that using internal organisation to deal with uncertainty allows for adaptive, sequential decision processes which economise on bounded rationality (Williamson, 1975, p. 25).

Opportunism is self-interested behaviour with guile, in making "false or empty, that is, self-disbelieved, threats and promises" in the expectation of individual advantage (Williamson, 1975, p. 26; Goffman, 1969, p. 105). Combined with small numbers relationships (the absence of a set of competitive bidders) the problem of bilateral monopoly negotiations is confronted. While it is in the interests of each party to seek favourable terms through representations and negotiation, the interests of the system as a whole are promoted if the parties can be joined to avoid the bargaining costs generated (Williamson, 1975, p. 27).

Asset specificity relates to idiosyncratic attributes of transactions such as investments in durable, transaction-specific assets which generate "lock in" effects by geographical location or dependence of demand by particular customers (Williamson, 1991, p. 281). Assets are seen as specific if they exhibit non-redeployable or non-salvageable characteristics. Such idiosyncratic exchange is, however, not limited to specific physical assets, but includes investments in human capital or embedded skills developed from personal knowledge generated through learning-by-doing (Polanyi, 1969; Nelson and Winter, 1982). The importance of asset specificity is that, while there may be a large number of bidders at the initial contract stage, the winner of the original contract obtains an advantage which upsets bidding parity at the contract renewal stage, leading to *ex post* contracting strains (Williamson, 1971, p. 116). The implication is that the identity of the parties to a particular transaction matters due to the continuity of the relationship implied by specificity (Williamson, 1985, p. 55).

Given a situation of uncertainty, the presence or absence of these three factors indicates a particular form of contracting. The absence of bounded rationality permits a contract to be struck which *ex ante* resolves all contingencies and for which court adjudication will be efficacious (Baiman, 1982, p. 168). The absence of opportunism facilitates reliance on contractual promises that prohibit strategic behaviour. The absence of asset specificity implies that parties have no continuing interest in the identity of each other, and competitive forces permit discrete market based contracting. Where all three factors are present, these devices fail (Williamson, 1985, p. 32):

> Planning is necessarily incomplete (because of bounded rationality), promise predictably breaks down (because of opportunism), and the pairwise identity of the parties now matters (because of asset specificity).

Based on this framework, Williamson (1985, p. 32) believes that the organisational imperative for governance is to:

> Organize transactions so as to economize on bounded rationality while simultaneously safeguarding them against the hazards of opportunism.

2.4.2 Information impactedness

When bounded rationality and opportunism are combined with environmental conditions of complexity, uncertainty, recurrence of transactions and asset specificity, a degree of market failure results. In the presence of severe transaction costs, markets may be less effective than alternative contractual arrangements including forms of internal non-

market governance, such as vertical integration or a bureaucratic hierarchy. This contracting framework is a useful context in which to analyse mutual nonprofit organisations. Transaction costs essentially represent information asymmetry problems, which are overcome by shifting institutional arrangements in favour of non-market mechanisms. Transaction cost economics has affinity to questions of information asymmetry posed by the nonprofit literature, although the former considers information problems within transactions more broadly. The nonprofit literature, by contrast, emphasises informational uncertainty in respect of the characteristics of commodities (Badelt, 1990, p. 59).

Williamson (1975) describes the Arrow (1969) and Akerlof (1970) concerns regarding adverse selection and moral hazard as an "information impactedness" problem. In particular, the adverse selection problem corresponds to *ex ante* information impactedness, while moral hazard constitutes *ex post* information impactedness (Williamson, 1975, p. 34). The problem of opportunism is posed not by asymmetry alone but by asymmetry combined with a high cost for obtaining information parity, and the scope of opportunism. The distribution of information becomes important in a small numbers bargaining situation. Even where initial information sets are equal, an opportunistic representation of fact poses information problems if the other party must bear a significant cost to confirm the veracity of the representation. Opportunism therefore requires assumptions both of information asymmetry and of bounded

rationality.

The question of institutional form is resolved by the development of an appropriate internal organisation (governance structure) which attenuates incentives for opportunism. A consequence of increasingly severe information impactedness is the emergence of a unified structure that removes the governance of the transaction from the market and places it within one organisation. This aspect of Williamson's analysis accords with the argument that information asymmetry prompts the formation of nonprofit organisations, consistent with the approach of Ben-Ner (1986, pp. 14-20), who described nonprofit organisations as a form of "backwards integration" by consumers. Such behaviour is akin to producers who engage in vertical integration to overcome transaction costs. Nonprofit firms reduce the tensions between producer and consumer otherwise found in the marketplace. Successive repetition and adaptation of contracts between buyer and seller fosters development of institutional and personal trust relationships. Individuals involved at the interface of an unfolding contractual relationship can hold a personal and organisational stake in the joint outcome. Idiosyncratic exchange relations will survive stress and display adaptability where personal trust is a feature (Williamson, 1985, pp. 62-63):

> Where personal integrity is believed to be optimal, individuals located at the interfaces may refuse to be part of opportunistic efforts to take advantage of (rely on) the letter of the contract when the spirit of the exchange is emasculated.

Krashinsky[4] (1986, pp. 166-117) notes that transaction costs also exist among consumers wishing to monitor producer output quality, since this information has public good characteristics, leading to "free rider" problems. Nonprofit firms address transaction costs by encouraging direct participation by customers in decision-making and overview, and by gathering consumers into organisations emphasising community and responsibility. These social pressures reduce free rider problems.

2.4.3 Advantages of internal organisation

Internal organisation, such as exists in the case of mutual nonprofit organisations, can be seen as advantageous in attenuating incentives to behave opportunistically, and in facilitating internal audit and dispute resolution. The formation of a mutual nonprofit organisation is similar to the formation of a "peer group" in Williamson's (1975) analysis. In particular, a peer group will provide an advantage over the market through limitation of membership in a discriminating way. This mitigates *ex ante* adverse selection problems and provides scope for application of social pressures and experience rating to attenuate *ex post* opportunism (Williamson, 1975, p. 43). Benefits of association accrue through increased productivity among members of a group with a sense of responsibility, engendered by an involvement with other members of

4 Krashinsky (1986) also suggests that a blanket prohibition against distribution of profits reduces transaction costs by providing a "standard form contract" enforceable by the state. This explanation relies on the nondistribution constraint, hence is

the group. Relationships characterised by confidence, proximity and friendship imply low transaction costs.

The importance of "trust" to nonprofit organisations, as discussed in section 2.3.1, is analogous to the role of "atmosphere" highlighted by Williamson (1975, pp. 37-39). The social contexts in which transactions are embedded have a bearing on transaction costs. Individuals' concern for a "satisfying exchange relation" becomes part of the economic problem where the exchange process itself is regarded as valuable. Market exchange encourages calculative relationships with respect to transactions, while internal organisation makes allowance for "quasi-moral involvements" (p. 38) among the parties, such as through perceived reciprocity (Gouldner, 1961). Altruism therefore economises on the transaction costs involved in policing and enforcing agreements (Hirshleifer, 1977, p. 28).

Altruism is important for relationships within the group and the mitigation of information asymmetry problems. Williamson (1974, pp. 149-150) notes the importance of obtaining a value consensus from social interaction within groups. This value consensus is due to the combined effects of a screening-selection procedure with a socialisation process. The screening-selection process occurs bilaterally given the search by organisations for compatible members and members for organisations with compatible values. Groups engaged in common or integrated tasks

unsatisfactory for the same reasons presented in earlier discussion.

will know the requisite attributes to screen for and monitor, as an associated activity to their work. Screening suggests that internal organisation will be superior to markets in experience rating behaviour, which addresses *ex ante* information impactedness (Williamson, 1975, p. 36). Socialisation is a process by which the major values of the group are internalised by its individual members. Socialisation, particularly in respect of organisational goals, values and history, plays a central role in the social learning process (Chao *et al.*, 1994; Schein, 1968; Fischer, 1986; Feldman, 1981). This also addresses *ex post* information impactedness by reducing the incentive for opportunism. The inculcation of social norms will enhance the strength of organisational loyalty and identification with group values (Simon, 1991, p. 36). While property rights and agency theorists focus on post-contractual monitoring and pre-contractual incentives (Alchian and Demsetz, 1972; Jensen and Meckling, 1976; Fama and Jensen, 1983a, 1983b), this analysis stresses the search for and screening of potential agents, and expenditure by the principal on socialising the agent so that the agent's personal preferences are closer to the principal's. This is consistent with new institutional economists, who have stressed the importance of screening, selection and socialisation mechanisms in the explanation of institutional forms (Stephen and Gillanders, 1993).

Screening and selection processes imply heterogenous distribution of preferences for non-market forms of reward. Generally, this suggests that cooperative arrangements and more market-oriented organisations will

co-exist due to the diversity in values held by individuals throughout society (Williamson, 1975, p. 45):

> Other things being equal, peer groups (or other internal modes) will presumably be organized by those individuals who find market transactions less satisfying than a nonmarket relationship, while markets will be favoured by those who prefer a more exacting, transaction-specific correspondence between rewards and deeds. Thus, given diversity of tastes for involvement relations, neither mode need fully displace the other, but both modes will coexist and each will appeal selectively to that part of the population to whose involvement tastes it most nearly corresponds, *ceteris paribus*.

Value consensus within the organisation is a means by which informational problems are overcome. The socialised value systems are means by which uncertainty is reduced, information flows are encouraged, and economic coordination enhanced. Boland (1979) states that one of the roles institutions play is to create knowledge and information for the individual decision-maker. In particular, institutions generate social knowledge needed for interaction with other individuals (p. 963). Social institutions serve to solve social problems by circumscribing the expectations of the behaviour of others, in particular by discouraging undesirable behaviour. The mutual nonprofit institution, by engaging in both *ex ante* selection and *ex post* socialisation, addresses information asymmetry and attenuates potential opportunism.

Nilsson (1996) argues that transaction costs decrease in the presence of cooperative principles and values. The importance of these values, or ethical norms held by the members, is in the coordination of otherwise incompatible interests and goals amongst the membership. The presence

of these values indicates a commonality of purpose acquired through history, recruitment and socialisation. A specific cooperative organisational culture is therefore valuable in operating the enterprise for the benefit of the membership. The values of the organisation and their entrenchment and selection processes provide a degree of homogeneity, which facilitates information flows through the organisation. Members' values should be homogeneous in respect of matters leading to easier communication and coordination (Nilsson, 1996, p. 639):

> Communications between members will be better, the goal-formulation process will run more smoothly, management of the business will be improved, goals will become more precise, and so on.

Newman (1976) discusses the supply of information through institutional structures themselves, and the potential for institutional information to substitute for market supplied information. In his view, institutional structures generate information by limiting individuals in their decision making. This follows from the sociological constraints and behavioural expectations of a particular institutional arrangement (p. 476). Institutional information might be more attractive than market information since it is normally cheaper and specifies behaviour directly. Market information requires transformation through rational decision processes. Indeed, information carried by non-market, informal channels, such as within the labour market (Rees, 1966), or institutional information may be regarded as more reliable by the recipient. According to Newman (1976, p. 485), this perspective permits a variety of

purportedly irrational decision making behaviour (from the neoclassical tradition) to be explained as a rational choice between institutional and market-based information.

2.5 Summary

The major issue discussed in this chapter is whether the essential feature of the credit union is its status as a nonprofit organisation. The literature on nonprofit organisations asserts that the nondistribution constraint is the important institutional feature to overcome problems of asymmetric information between producer and consumer. Nonprofits can be "trusted" not to exploit their advantage over consumers. This approach is unsatisfactory, particularly given the lack of a theoretical elaboration on the connection between this constitutional limitation and the assumed altruistic behaviour by members of the organisation. By way of contrast, agency theory suggests that, due to the nondistribution constraint and other governance features of nonprofit organisations, market-based disciplining mechanisms are ineffective. Nonprofit organisations would therefore be less efficient and suffer from significant problems of managerial motivation.

The more important aspects of nonprofit organisations lie in altruistic social norms, and the development of trust relationships amongst members of the organisation. These social norms provide informational advantages through encouragement of cooperation and the basis for nonpecuniary forms of reward for managers. This implies a pattern of

screening and socialisation as an element of membership structure and manager selection. In turn, the institutional basis for the social norms can be divided into two categories of organisation - "ethical" and "mutual", where embedded ideologies or integration of producer and consumer interests, respectively, are dominant. Of importance to this thesis is the comparative advantage of mutual nonprofit organisations (such as credit unions) in the community of interest between producers and consumers that addresses information asymmetries. This analysis is supported by analogy to transaction cost economics, which argues that non-market contractual arrangements, such as internal organisation of transactions, are rational responses to information impactedness. Adverse selection (*ex ante* impactedness) and moral hazard (*ex post* impactedness) problems are addressed within the mutual nonprofit organisation by, respectively, screening-selection and socialisation processes in respect of both members and managers.

The essential feature of the credit union is unlikely to be its nonprofit status, but its mutual membership and governance structure, for which any nondistribution constraint will be incidental. Mutual nonprofit organisations will be more likely to have a comparative advantage over for-profit firms under the following conditions:

- significant problems of information asymmetry would otherwise exist between producer and consumer;
- the product generates positive externalities, which are more

likely to be localised within a community;

- members of the organisation have a social connection through residential, cultural, religious or other affiliation;
- the organisation engages in screening-selection and socialisation processes for its members and managers;
- the organisation is small; and
- the organisation subscribes to cooperative social norms.

The following chapter applies this framework to the phenomenon of mutual financial institutions, of which credit unions are a dominant subset, to analyse the areas of comparative advantage for these organisations in executing financial intermediation.

Chapter Three
Financial Mutuals

In analysing the economics of credit unions, the previous chapter examined whether the nondistribution constraint is the essential institutional feature. It was argued, however, that mutuality is the more important element of the structure of nonprofit organisations, emerging in response to information asymmetries between producer and consumer. Such organisations have comparative informational advantages over private producers under certain conditions.

This chapter critically reviews the economic literature in respect of mutual financial institutions or "financial mutuals" - a term used widely to describe mutual organisations that specialise in financial intermediation and provision of insurance services. Mutual associations are significant within the insurance and banking industries (Hansmann, 1985). In Australia, credit unions form a dominant subset of financial mutuals. The United States has a broader range of mutual financial institutions including mutual savings banks, savings and loans, and insurance funds. Most of the economic literature, particularly empirical studies, has analysed these American institutions.

One conventional approach is to view financial mutuals, *prima facie*, as inefficient relative to shareholder-owned companies. Mutual ownership and governance structures impede a specialisation in risk bearing and the

harnessing of market forces to align managers' interests with those of the members to promote efficiency. These arguments are similar to the agency problems discussed in section 2.2. Under this view, mutual institutions survive in a competitive market only due to special privileges and exemptions provided by government, or by agency control mechanisms in the form of redeemable member claims (Fama and Jensen, 1983a, 1983b). As a policy matter, conversion from mutual ownership to shareholder ownership is seen as inherently desirable to promote risk-bearing efficiency.

This conventional approach is unsatisfactory. This chapter argues that financial mutuals principally address severe information asymmetry problems within financial intermediation and insurance markets. This claim is presented from two perspectives. One is based on agency theory, in which the mutual form of ownership eliminates conflicts between depositors/policyholders and shareholders, addressing shareholder-debtholder agency problems. The other perspective is informational. Within insurance and credit markets, the mutual ownership structure ameliorates problems of adverse selection and moral hazard through screening and monitoring mechanisms.

The economic literature specifically dealing with credit unions is appraised within the context of this informational perspective. A problem with studies of credit union behaviour has been vagueness about organisational objectives. This ignorance of what credit unions do, or should, maximise, leads to crude empirical approaches. Benefits of credit

union membership, for example, are seen merely as differential rates of return on saving and borrowing relative to private financial institutions. An alternative approach is presented which focuses on the institutional characteristics of mutuality, and particularly the common bond of association.

3.1 Agency Perspective

Given the absence of market disciplinary mechanisms, manager-member agency problems are likely to be severe, creating inefficiencies. Although alternative mechanisms to address agency problems are proposed by Fama and Jensen (1983a, 1983b), particularly redeemable member claims, this explanation of the existence of mutual organisations is unconvincing. More important, from an agency perspective, is the amelioration of the agency problems of debt, through integration of owner and depositor interests. A related argument is that manager risk-aversion, a serious agency "problem" for profit-oriented corporations, may be appropriate for prudent management of a financial mutual.

3.1.1 Assumed inefficiencies

Managers of shareholder-owned organisations are expected to have "highly efficient" incentives given the disciplining effects of the market for financial services, the firm's internal labour market and ultimately the takeover mechanism. As discussed in Chapter Two, the manager of a mutual organisation is unlikely to be disciplined in this way. The consumption of perquisites by mutual managers was not limited by

market-based disciplinary processes. Mutuals are unable to use the share price as a means to contract with the manager to align incentives. Instead, depositors may only have access to accounting information to instruct them on past performance. This information might be unreliable, deliberately misleading, or simply too difficult to understand.

The failure to define property rights with clarity is assumed to lead to economic inefficiencies (O'Hara, 1981). Rasmusen (1988) argues that managers of mutual banks (credit unions and savings and loan associations) are effectively self-controlling, limited only by government intervention. The conclusion is that these organisations are inevitably inefficient (p. 396):

> Since the managers of a mutual cannot be punished by stockholders, they are unlikely to minimise the cost of banking services.

Under this view, mutual institutions should not survive in a competitive market, given assumed processes of natural selection. Some property rights literature speculates that, given these inefficiencies, nonprofits can survive only under privileges from the state, such as tax exemptions and subsidies (direct and indirect), or statutory restrictions against free entry and exit (O'Hara, 1981, pp. 331-332). Removal of these privileges would lead to the demise of mutual organisation in particular sectors (Hansmann, 1990, p. 66). More pertinent is the observation that mutuals may have an advantage in that services can be provided more cheaply than comparable private or public organisations, due to contributions of volunteer workers (Rudney, 1987)

and lower paid labour (Borjas, Frech and Ginsberg, 1983). These latter explanations are also consistent with the cooperative nature of the mutual and the existence of embedded social norms.

3.1.2 Separation of management and control

Agency theory has been extended to organisational forms beyond that of the shareholder-centred corporation. Assuming a competitive environment, only those organisations that are able to address agency problems at lower cost should survive. Agency theory seeks to explain the survival of organisations other than market-disciplined shareholder corporations, through the effectiveness of internal decision structures in ameliorating agency divergences between managers and owners. Special features of different organisational forms emerge as efficient approaches to controlling agency problems (Fama and Jensen, 1983b, p. 328).

Fama and Jensen (1983a) draw a distinction between *decision management* (the initiation and implementation of decisions) and *decision control* (the ratification and monitoring of decisions and decision agents). Control of agency problems implies that separation of residual risk from decision management leads to decision systems that separate decision management from decision control (Fama and Jensen, 1983a, pp. 303-304). This characteristic is not restricted to companies with a share capital and clear specialisation of risk bearing functions, but to all organisations where the decision-makers do not bear a major share of the wealth effects of their decisions. These include open corporations, large

professional partnerships, financial mutuals and nonprofit organisations. This separation explains the survival of these organisations in competitive markets.

According to Fama and Jensen (1983a, pp. 310-311) three major mechanisms exist for implementing this separation. One type of mechanism is a decision hierarchy, where higher level agents ratify and monitor the decisions of lower level agents, making it difficult for individuals to take advantage of the residual claimants. Such hierarchies are supported by control devices such as accounting and budgeting systems. This mechanism is related to Williamson's (1975) concept of governance through bureaucratic hierarchy. A second mechanism is mutual monitoring. This draws upon less formal sources of information by agents whose interests lie in use of the information to enhance the value of their own human capital. Mutual monitoring represents an internal labour market (Fama, 1980). Agents have an incentive to enhance the internal reward system as it reduces the uncertainty of returns from their efforts. Incentive structures encourage mutual monitoring by decision agents.

A third mechanism is the board of directors, acting at the apex of the decision control system. Exercise of powers in respect of the most senior managers ensures a separation of decision management and control. Agency literature argues that outside directors perform an important monitoring function (Fama, 1980). This is consistently confirmed by a number of empirical studies (e.g. Weisbach, 1988; Rosenstein and Wyatt,

1990; Byrd and Hickman, 1992; Lee, Rosenstein, Rangan and Davidson, 1992; Brickley, Coles and Terry, 1994).

3.1.3 Advantages of the financial mutual

One important aspect of the financial mutual in terms of separating decision management and control is that member claims are redeemable on demand for an amount of compensation based on a predetermined valuation rule. The member of a mutual savings bank may redeem a membership interest by withdrawing deposited funds together with accumulated interest or dividends. (Fama and Jensen, 1983a, p. 317):

> The decision of the claim holder to withdraw resources is a form of partial takeover or liquidation which deprives management of control over assets.

The redeemable claim is described as fulfilling a "control function" (1983b, p. 337) analogous to the market for corporate control. This "control right", however, can be exercised without a proxy fight, a tender offer, or other form of takeover bid (1983a, p. 317). This suggests a self-help device available to discipline management through the product market - the right of a customer to purchase services elsewhere.

The other important element is the board of directors. The argument is that the use of outside directors is a substitute control mechanism in mutual organisations. Combined with Williamson's (1983) hypothesis that board composition in part will be determined by the presence (or absence) of other governance mechanisms, studies have been made of a "substitution hypothesis" that the relative importance of outside directors

is greater for mutuals. Ownership structure and board composition are therefore strategic complements (Milgrom and Roberts, 1990). Mutuals will appoint more outside directors than shareholder companies. This is confirmed empirically by Mayers, Shivdasani and Smith (1997) in a study of the insurance industry. They find that: mutual insurance firms employ more outside directors than shareholder companies; firms changing between shareholder and mutual characteristics adjust board composition; mutual by-laws more frequently stipulate participation of outside directors; and mutuals with more outside directors incur relatively lower expenses.

The monitoring role of outside directors, however, appears in Fama and Jensen's analysis to be less important than the control right found in the liquidation of member claims (1983a, p. 318, emphasis added):

> Because of the *strong form of diffuse decision control* inherent in the redeemable residual claims of financial mutuals, however, their boards are less important in the control process than the boards of open nonfinancial corporations.

It follows that the role of the board is principally for monitoring of agency problems against which liquidation of member claims are little protection such as "fraud or outright theft of assets by internal agents" (1983a, p. 318).

Fama and Jensen believe that specialisation of ownership structures can also be explained by portfolio considerations. Redeemable claims, if based on a marketable portfolio, can rely on capital markets for valuation. Organisation-specific assets with problems of valuation need to rely on a secondary market, such as the sharemarket, for valuation of residual

claims. According to Fama and Jensen, this explains why some financial organisations are mutuals and others are open corporations. Mutual organisations will manage portfolios of financial assets whereas corporate financial organisations require organisation-specific assets that are expensive to trade, generate uncertain future net cash flows, and are not easily priced. This requires residual claims to be defined and vested in specialist risk bearing capital (1983b, p. 339):

> The primary assets of commercial banks are short-term loans. Granting and renewing these loans involves monitoring the borrowers and certifying credit worthiness - a service for which the borrowers pay. The capital value of the stochastic net cash flows from services to depositors and borrowers would not easily be captured in the internal pricing rule of a redeemable residual claim.

Under this view, commercial banking survives with an open corporation structure since redemption of depositor claims can be met by purchases and sales of bonds. Importantly, it is assumed that the residual claim holders are not depositors, since internal valuation of the uncertain cash flows from intermediation activities would be difficult. Instead, the residual rights are assigned to shareholders, whose claims are not redeemable. This leads to development of a secondary market for shares as the means of valuation (Fama and Jensen, 1983b, p. 347):

> Redeemable claims are a high cost mechanism for control in activities that involve large amounts of assets not traded in secondary markets.

This "mixed" structure between fixed value redeemable claims (deposits or policies) and non-redeemable residual claims (stock or shares)

characterise open corporations specialising in financial services. Fama and Jensen conclude that open corporations will be more involved in "business activities" which (implicitly) rely on nonfinancial assets. The Fama and Jensen arguments suggest that there is a trade-off between relatively low agency costs within a mutual organisation and the potential efficiency gains from separation and specialisation of the decision and risk-bearing functions (Williams, 1986, p. 272).

3.1.4 Problems with Fama and Jensen

These explanations of the agency cost advantages of financial mutuals put forward by Fama and Jensen are unsatisfactory. One reason is an inappropriate focus on property rights and residual risk bearing which overlooks the informational advantages of mutuality. Williamson (1983) disagrees with Fama and Jensen's (1983a; 1983b) emphasis on the allocation of residual risk bearing as the determinative factor of organisational form. Rather, the decomposition of decision management and control functions with an organisation is based on strategic considerations and the recognition of limits on human information processing, or bounded rationality. This implies that the survival value of organisations with decomposed decision structures is principally to be found in informational advantages. The separation of functions noted by Fama and Jensen therefore results from complexity of the organisation, not simply the allocation of residual claim rights. Klein (1983) also believes that the correlation of the separation of residual claimant and

management with the size of the organisation suggests that the hypothesised risk-sharing benefits are not the principal reason for separation (p. 371).

The argument that a "control right" allegedly exists in the ability to liquidate membership claims is unconvincing. In particular Fama and Jensen fail to explain how this "special form of control" can be distinguished from the effect of competitive market forces on open financial corporations, such as banks and shareholder-owned insurance companies. Particularly within insurance markets, the opportunity to redeem member claims may itself be limited and impractical (Hetherington, 1969b, p. 1087). Even if the impact on management of claim redemption is significant, the device would operate negatively through withdrawal of funds where management is inefficient or incompetent.

The characterisation of mutual organisations as merely managing marketable portfolios is also too restrictive. Incongruously, savings and loan associations, many of which have mutual ownership structures, appear not to be treated as "mutual" in Fama and Jensen's analysis of statistical evidence (1983b). Savings and loans and credit unions, like commercial banks, hold loans as their principal assets. This suggests the use of nonfinancial assets engaged in "monitoring the borrowers and certifying credit worthiness" (1983b, p. 339). According to Fama and Jensen, the capital value of the financial intermediation services provided by these organisation cannot be captured easily within the parameters of a

redeemable claim. This implies (as quoted above) a *high cost* in the use of redeemable claims to control agency problems. In their analysis, credit union operations should be unsustainable in a competitive environment.

In summary, agency theory fails to provide a satisfactory explanation for the existence of financial mutuals from the view of member-manager divergence and a limited or absent market disciplining mechanism. Better arguments are that the mutual form has a comparative advantage in addressing the agency costs of debt, which outweigh these disadvantages, and that manager risk-aversion is an advantage in terms of prudence for financial institutions. These arguments are presented in the following sections.

3.1.5 Agency costs of debt

Agency theory suggests that the choice between shareholder and mutual forms of ownership is based on the relative costs of controlling incentive conflicts between owners and managers as against owners and debtholders. In contrast to the potential manager-shareholder agency problems, mutuality tends to reduce shareholder-debtholder conflicts. As discussed in section 2.2.1, divergent behaviour by shareholders against the interests of creditors include: excessive dividends, asset substitution, underinvestment and claim dilution (Smith and Warner, 1979). Shareholders have an incentive to increase the riskiness of investments after debtholders have invested. Whereas the depositors of a bank are almost exclusively customers, the depositors (and borrowers) within a

mutual financial institution, in a legal sense, own the organisation. Hence, an incentive to increase risk to transfer wealth from depositors to shareholders is inconsistent with the organisational structure. For banks and insurance companies, mutuality removes the incentives for shareholders to take risks which might impair the integrity of an insurance or deposit fund (Alchian and Woodward, 1987, p. 133). The major usefulness of a mutual form of organisation is the avoidance of agency costs of debt, which can place credit unions at a competitive advantage over some profit oriented institutions (Davis, 1994).

Mayers and Smith (1986) suggest a similar explanation for mutual associations in the insurance industry. Policyholders in insurance firms face incentive problems analogous to debtholders. Shareholders of an insurance company have incentives to increase the value of the firm after policies have been issued, by changing dividend policy or by asset substitution (Mayers and Smith, 1986, p. 75). In respect of mutual insurance, it has been asserted that, given the single class of capital provider, a mutual firm only faces agency conflict between managers and owners (Hansmann, 1985). Mayers and Smith (1981, 1986, 1988 and 1992) argue that the major benefit of the mutual form of organisation was in the reduced agency costs imposed on insurance policyholders over the lives of their policies. The net cost advantage to the mutual is to be found in the relative benefits in controlling debtholder-shareholder costs over the relative disadvantage in controlling managerial incentives (Mayers and Smith, 1986, p. 77).

3.1.6 Risk aversion and prudence

The manager's undiversified investment in the financial mutual implies aversity to firm-specific risk. As discussed in section 2.2.3, agency theory argues that managers who are insulated from the discipline of shareholder voting, share prices, or the market for corporate control, are unlikely to be highly motivated, aggressive and innovative. This environment suggests an approach to management that is instead based on stability and conservatism. While such managerial incentives may be undesirable from the perspective of specialised risk bearers, it may be a desirable role for the manager of an insurance company or financial institution. Prudence accords with a public interest in avoiding institutional failure and potential contagion effects (Hetherington, 1969b, p. 1091). For example, Rasmusen (1988, p. 407) believes that a manager's independence from outside control guarantees a cautious investment policy. The argument is that a mutual manager, in seeking to protect their own position and consumption of perquisites, will always choose a less risky investment project. If depositors are informed about the risks of the intended investments by shareholder and mutual banks, the former can offer a higher interest rate to depositors commensurate with the risk and level of capital reserves. The mutual banks cannot compete with this interest rate unless they too engage in risky investments and refrain from consumption of perquisites. In contrast, where depositors are uninformed about the risk of investment projects and levels of capital reserves, they will choose the mutual bank. This argument is similar to

the justification for high wages put by Klein and Leffler (1981). A manager does not wish to lose a stream of quasi-rents so will be risk averse to avoid bankruptcy. Since the manager will be unwilling to assume risk, the safe project will always be selected. This will benefit uninformed investors seeking lower risk and enhance the stability of the financial system (Rasmusen, 1988, p. 405):

> The advantages of stability and safety outweigh the disadvantages of poor management and high expenses.

On similar reasoning, Mayers and Smith (1986, 1992), and Smith and Stutzer (1990) predict that mutual insurers are associated with less risky activities. This hypothesis is tested by Lamm-Tennant and Starks (1993), using a sample of 79 stock and 91 mutual insurers in the United States from 1980 to 1987. A logistic regression model attributed more risk to the stock insurers than the mutuals. This result is supported by disaggregated tests based on product line and geographic area.

In a study of aggregate data of savings and loans associations from 1973 to 1977, O'Hara (1981) finds that shareholder-owned associations exhibit a higher risk profile than did the mutual associations. In particular, shareholder-owned associations hold greater proportions of real estate related investments and use borrowings as a substitute for deposits more frequently (p. 327). Given the foregoing, it is arguable that depositors unwilling or unable to monitor the investment portfolio choose a mutual on the basis that managers have stronger incentives to adopt a safe portfolio (Rasmusen, 1988, p. 396).

Overcoming agency costs of debt and of the role of risk aversion in ensuring prudence is an important element in the explanation of the comparative advantage of financial mutuals. Reliance on the agency arguments alone would be inadequate. Some assert, for example, that the comparative advantage in respect of elimination of depositor-shareholder problems is removed once deposit insurance is available (Masulis, 1987, p. 32). The inability to raise capital by issue of shares is also perceived as a "financial weakness" of the mutual organisation (p. 33). Even given these comparative advantages in addressing some agency problems, the mutual form of organisation is regarded as inadequate where access to capital, efficiencies of operation, and growth are seen as important objectives (Hansmann, 1980, p. 879). An alternative perspective, based on the informational advantages of mutuals in financial markets, is presented in the following section.

3.2 Informational Perspective

The previous section reviewed the economic literature on financial mutuals, emphasising the agency perspective. In this context, a mutual ownership structure fails to define property rights in residual claims with sufficient clarity, impeding objectives of efficiency and the use of market-based incentives and discipline. This suggests severe shareholder-manager agency costs. Fama and Jensen (1983a, 1983b) argue that alternative mechanisms arise to deal with these agency costs through separation of management and control, by internal hierarchies and labour markets, as well as the role of the board of directors in monitoring

management. In the particular case of financial mutuals, they believe the redemptive nature of member capital contributions creates a specialised form of agency control mechanism. This hypothesis is, however, unconvincing. A better explanation is in the amelioration of agency costs of debt, by creating an identity between depositors/policyholders and owners. In addition, the conventional view of manager risk aversion as an agency "problem" is inappropriate for the case of the financial mutual. As a public policy question, the prudence, stability and conservatism implied by manager risk aversion may be more appropriate for financial institutions as a question of public policy.

The agency perspective provides, however, only part of the explanation for the financial mutual. This section proposes an informational perspective - that mutuals have comparative advantages in markets characterised by severe information asymmetries. Financial mutuals have comparative advantages since financial markets have this characteristic. This section begins with an examination of information asymmetry issue for financial intermediation, then outlines the evolution of mutual forms of financial institutions in developing economies, nineteenth century Germany and the United States. It is argued that these institutions emerged principally in response to problems of adverse selection and moral hazard in credit markets.

3.2.1 Information asymmetry

Alchian and Woodward (1987) state that mutual ownership is

advantageous where (p. 133):

> . . . information is expensive, expropriation is possible, and long-term relations between producers and consumers prevail.

It is argued that financial intermediation, like insurance markets, is characterised by significant problems of adverse selection and moral hazard. Intermediation itself is profitable due to imperfect information flows between potential borrowers and lenders (Davis, 1995, pp. 43-44). Overcoming these information difficulties requires monitoring, screening, and mechanisms for aligning of incentives, such as property security. The adverse selection and moral hazard problems of insurance are well documented. These issues have been canvassed in section 2.2.

There are two principal areas where information asymmetry creates problems. One is in the customer's relationship with a financial intermediary as saver, and the other is in the relationship as borrower. As to the former, one information problem is the moral hazard illustrated by the agency costs of debt. Owners have an incentive, once savers have invested, to increase the risk of investments. The financial mutual is unlikely to have such an incentive, providing a low risk vehicle for savings, as discussed in section 3.1.5. Another information problem is in delegated monitoring. Diamond (1984) discusses a model of financial intermediation based on minimum cost production of information resolving incentive problems between borrowers and lenders. A financial intermediary obtains funds from depositors and lends them to third parties. The financial institution, as intermediary, is

delegated the task of monitoring loan contracts on behalf of the depositors. The institution has a comparative advantage in monitoring due to its observation of private information and experience in lending. This issue is also closely linked to agency problems. Davis (1995) points out that delegated monitoring is only one aspect of a more complex set of agency problems, between the stakeholders of a financial institution.

Of significant interest from an informational perspective are potential adverse selection and moral hazard problems within the credit market. The theoretical understanding of credit markets has evolved from an information paradigm, which emphasises the problems of imperfect screening, incentives and enforcement. Lenders exchange money today for money in the future. Lenders will attempt to insure against default risk, to acquire information regarding the characteristics of borrowers, and to develop enforcement mechanisms to increase the likelihood of repayment (Hoff and Stiglitz, 1990, p. 237). The credit market is therefore subject to problems of adverse selection and moral hazard. Borrowers differ in the likelihood that they will default, and poor risk borrowers will have incentives to disguise their true characteristics. This suggests a serious adverse selection problem, which is imperfectly addressed by costly screening processes. Moral hazard arises where the borrower fails to act to improve the likelihood of repayment. This results from a misalignment of incentives between borrower and lender analogous to the shareholder-debtholder agency problem discussed earlier. This incentives problem is exacerbated in circumstances where legal and other

enforcement mechanisms are inadequate.

3.2.2 Screening and monitoring

The credit market has unusual features in contrast to physical product markets. Interest rates do not always act as a rationing mechanism within credit markets. An increase in interest rate signals a greater degree of risk involved in the project to be undertaken with the loan. Thus, the interest rate is a price as well as an instrument for regulating the risk composition of the lender's portfolio (Stiglitz and Weiss, 1981; Stigler, 1987). Credit is likely to be rationed through direct means such as screening of borrowers rather than by rises in price (interest rate) reducing demand (Hoff and Stiglitz, 1990, p. 239).

Direct screening and monitoring mechanisms will be a prominent feature of credit markets to overcome adverse selection and moral hazard problems. The costs for these activities may be relatively lower to lenders who are able to exploit their proximity (geographically, economically and socially) to the potential borrowers. In rural credit markets, there is considerable evidence that informal sources of finance - such as through kinship groups or local moneylenders - are important and viable even in the face of subsidised competition from formal institutional lenders. Informal moneylenders address the adverse selection problem by acquiring an intimate knowledge of the borrower's character and circumstances. They deal with only longstanding clients, accepting new borrowers only after extensive investigation for the purposes of screening,

and engage in ongoing monitoring. Aleem (1990) finds screening costs for rural moneylenders in Pakistan to be substantial. On average, screening involves at least one full day of the lender's time as well as significant transport costs. Inquiries are made of the farmer's likely marketable crop surplus, the manner in which he conducted business, his indebtedness and reputation in the market. These inquiries include interviewing other farmers in the applicant's village who are already known to the lender. The cost of screening is also increased by a high rejection rate of over 50% of applicants. Principally due to the screening process, the cumulative rate of default is on average 2.7%, a much better result than achieved by institutional lenders, whose default rates are more than 30%. High interest rates charged by moneylenders are more of a reflection of the costs of screening potential borrowers, rather than an exercise of monopoly power over local communities.

Screening mechanisms, which overcome information problems, can include interlinking of credit with other transactions. The lender may also provide goods and services to the borrower or act as the borrower's landlord (Braverman and Stiglitz, 1982). Forcing a crop to be sold to or through the lender provides a form of quasi-security as well as a stream of valuable private information about the borrower.

Although governments have encouraged mainstream banking institutions to enter rural markets, moneylenders continue to thrive given their more intimate knowledge of the potential borrowers (Stiglitz, 1990, p. 352):

> [Moneylenders] can separate out high-risk and low-risk borrowers and charge them appropriate interest rates; and they can monitor the borrowers more effectively, making sure that the funds are used productively and thus lowering the default rate.

In northern Nigeria, for example, credit markets are almost completely segmented along geographic lines and kinship groups. Some 97% of the value of credit transactions are between individuals in the same village or kinship group, overcoming information asymmetry (Udry, 1990). In Thailand, village kinship structures are matrilineal, so women tend to be dominant among informal lenders (Siamwalla *et al.*, 1990). Another example of the value of local area knowledge is the Orangi Charitable Trust, a credit institution investing in small-scale enterprises in a slum in Karachi (Inayatullah and Birley, 1997). A major contributing factor to its financial success (including a repayment rate of 94%) was identified as the development of efficient and robust lending procedures, particularly a strong appraisal and monitoring process. Critical to the lending procedures were local area supervisors who tend to know the applicant personally and were "well integrated into local socio-ethnic networks" (p. 315). Personal guarantees and group lending complemented lack of sufficient security, and emphasised socio-cultural dependence. Similar results have emerged from empirical studies of moneylending in rural communities within contemporary India (Akerlof, 1970; Bell, 1990), Bangladesh (Stiglitz, 1990) and Pakistan (Aleem, 1990).

3.2.3 Peer monitoring

One organisational mechanism for reducing the chances of default (addressing moral hazard) is peer monitoring. Stiglitz (1990) believes that peer monitoring is an effective way of designing an incentive-monitoring system in the presence of costly information. An example of peer monitoring is the Grameen Bank operating within Bangladesh. Its record of very low default rates (approximately 2% compared with other lenders with rates of 60% to 70%) is based on loans being made to small groups of farmers who are mutually responsible for repaying the loans. Other members of the group cannot obtain credit until existing loans are repaid Threats to cut off future credit also induces desired borrower behaviour (Stiglitz and Weiss, 1983). The small sizes of the borrower groups (approximately five) increase the incentives for monitoring. A larger group may suffer from free rider problems. The Grameen Bank is able to exploit the local knowledge of group members, and an incentive structure whereby others within the village do the monitoring for it. By encouraging self-selection into these borrowing groups, the bank is exploiting the local farmers' informational advantage not only in monitoring but also in initial screening (Stiglitz, 1990, p. 362). A similar peer monitoring mechanism operates within the Bank for Agriculture and Agricultural Cooperatives in Thailand (Siamwalla *et al.*, 1990).

Similar processes for credit allocation in developing countries include rotating savings and loan associations, or *tontines* as they are described in some African nations. Members, typically from a village or family group,

agree to pay periodically into a common pool. Each, by rotation, can then borrow a larger sum to finance an expensive purchase. The credit exchange between these individuals as both lenders and borrowers is enhanced by powerful social sanctions. This improves upon the operation of the conventional market and provides funds with very small spreads between saving and borrowing rates (Hoff and Stiglitz, 1990, p. 244):

> [B]y creating a group of individuals whom the borrower comes to know, and who would be hurt if he defaulted . . . the borrower performs more reliably than if the cost were borne only by the lender, with whom the relationship is brief and impersonal.

These types of associations agree with the argument that mutual organisations emerge in response to severe information asymmetry, providing benefits to members based on its informational advantages, including non-market-disciplining mechanisms. This explanation of the mutual is also supported by the evolution of German banking cooperatives and mutual institutions in the United States.

3.2.4 Banking cooperatives in Germany

Bonus and Schmidt (1990) examine the evolution of the cooperative banking group in Germany in the nineteenth century. The usefulness of the Raiffeisen credit cooperative is principally in the cost advantages in dealing with information relevant to the risk of lending to small farmers, tradesmen and craftsmen. To assess credit risk, a lender would need to gather and analyse a great deal of information on both the individual and

the local community. This is difficult to acquire and relies upon local knowledge as well as an understanding of the nature of the trade. Banks would find the cost of acquiring this information prohibitive relative to the size of the potential revenues from writing the loan. Moreover, at the time the banks had no experience with the specifics of the business of farming and would find it difficult in developing criteria by which loans could be assessed. This supports the argument that informational problems were significant contributors to the lack of adequate finance in these rural communities, who often depended heavily on local moneylenders and paid high rates of interest. Moneylenders operated within limited geographical areas and acquired a great deal of local knowledge relevant to assessing credit risk. The high cost of credit obtained through these individuals reflected the high cost of information acquisition and pursuit of delinquent borrowers (Bonus and Schmidt, 1990, p. 187).

Formation of credit cooperatives drew upon the local informational advantages to provide credit to members without the degree of associated costs for screening and monitoring incurred by moneylenders and passed onto borrowers. The Raiffeisen cooperatives, at negligible cost, tapped the private information sources of its members regarding the personal and family backgrounds of members of the local community, their property, and local economic conditions. This provided a significant informational advantage over any outside bank in assessing creditworthiness. Bonus and Schmidt (1990) argue that the association was an economic coalition

(Alchian, 1984) in which the coalition-specific quasi-rent was substantial, given the high rates charged by moneylenders and the lack of interest by outside banks in providing credit. Powerful incentives followed to ensure that no applicant was admitted to membership and extended a loan that did not live up to high standards of personal integrity. Screening processes were therefore essential to the operation of the cooperative.

The structure of the cooperative is also explained by the reliance on the members' human capital. The actual capital shares held by members thus bears no relation to the actual capital of the association. Bonus and Schmidt (1990, p. 188) compare a capital share to an "entrance fee", of a symbolic nature. Democratic governance in terms of one-member-one-vote follows from the fact that capital contributions are not a measure of the resources pledged by individual members but instead reflect the members' joint responsibility for the cooperative. Membership rights were non-tradeable, which is consistent the importance of the identity of the members of the cooperative and their mutual economic interdependence.

3.2.5 Mutual banks in the United States

Two other forms of financial institution, mutual savings banks and mutual savings and loan associations, also illustrate information problems in financial intermediation. The advantage of mutual savings banks is in the informational benefits for savers, while the advantage of

mutual savings and loans is in the benefits for borrowers.

Drawing upon histories of the development of mutual savings banks in the United States (Teck, 1968; Welfling, 1968), Hansmann (1990) examines the evolution of the industry from the perspective of information asymmetry. Mutual savings banks arose in the early nineteenth century and provided the only place for individuals of modest means to invest. Some of these banks were set up by philanthropic businessmen, who donated the initial capital, to prevent pauperism and encourage thrift (Welfling, 1968, p. 17). These charitable motives alone, however, did not provide a satisfactory explanation for the growth of mutual savings banks. Of greater relevance was the state of commercial banks in the nineteenth century. These dealt principally with businesses, through discounting of merchants' bills of exchange, and did not accept small deposits from individuals. Capital was raised by issue of equity to wealthy investors. More importantly, commercial banks were seen as too untrustworthy for individuals to make investments (Clain-Stefanelli, 1975). In particular, the sector was largely unregulated with no requirements for reserves or restrictions on investments. This provided an incentive for commercial banks to behave opportunistically towards depositors (Hansmann, 1990, pp. 69-70):

> In short, consumer deposit banking was characterised by a high degree of asymmetric information (contract failure) in its early years: depositors could not know, or control, what commercial banks were doing with their funds.

Shareholders of the banks had an incentive to invest in highly

speculative ventures, capturing the benefits if successful, but leaving the creditors and depositors to bear a substantial part of the losses if they failed. The riskiness of these commercial banks was demonstrated by the high rates of failure and collapse, of up to 50% in the mid-nineteenth century. Mutual banks therefore provided a safe haven for depositors. It should be noted that Hansmann believes that the nondistribution constraint is the critical element in the trustworthiness of the mutual banks. As argued in section 2.1.3, this emphasis on the nondistribution constraint is unsatisfactory. The events should be interpreted on the basis that trust does not arise from the nondistribution constraint, but requires the identity between depositors and owners inherent in the mutual organisational structure.

The comparative advantage of mutual savings and loan associations lies in the lower cost these organisations incurred in addressing adverse selection and moral hazard problems in lending. This efficiency relies on the social distance between the members of the association (Hansmann, 1990, p. 74). The institution arose in the 1830s, as vehicles whereby small groups would pool their savings and from which they would take loans, in turn, to finance purchase or construction of a house. The members would have superior information with which to determine the risk of a loan to one of their members. Even in hard times, a borrower is less inclined to default with the knowledge that friends, colleagues, and neighbours would bear the loss. This explanation is consistent with the cases of peer monitoring, such as the Grameen bank and African *tontines*,

as well as the German credit cooperatives.

3.3 Credit Union Behaviour

To this point, the discussion in this chapter has been on financial mutuals generally. The comparative advantages of their ownership structure lies in overcoming informational problems of financial intermediation and insurance provision. The economic literature specifically modelling credit union behaviour is now reviewed in this context. A number of formal models have been proposed with a range of objective functions, and minimisation/maximisation rules applied to explain operational decisions. These models fail to capture the essential features of credit unions as financial mutuals, as discussed earlier in this chapter. A theory of credit union behaviour is proposed, with a basic assumption of management self-interest, moderated by the influence of the common bond. The common bond is identified as the principal determinant of credit union behaviour.

3.3.1 Formal economic models

Much mainstream economic literature rejects the proposition that credit unions are significantly different from other financial institutions for the purposes of economic analysis (Navratil, 1981). Yet, models of a financial firm based on profit maximisation cannot be translated directly to a credit union environment (Smith, Cargill and Meyer, 1981). This creates difficulties in the definition of an appropriate objective function. A variety of formal models has been suggested, using alternative objectives.

One approach is to assume that credit unions minimise costs, based on an exogenously determined level of output (Fry, Harper and Stansell, 1982; Koot, 1976; Murray and White, 1980 and 1983; Navratil, 1981; Wolken and Navratil, 1980). This assumption is typically defended as reflecting competitive market forces.

Smith (1984) believes, however, that the cost minimisation assumption is theoretically deficient. While cost minimisation is relevant and important, it does not address the objectives of the credit union inherent in its structure as a financial services cooperative. In particular, output should be treated as not exogenous (Baltensperger, 1980) but endogenous to choices made by credit union managers as to interest rates and non-price characteristics of the services offered to members. Smith (1984) suggests a formal model based on an objective of maximising provision of financial services to members, measured in terms of differentials on the rates of deposit and loan interest rates. The general objective function is to maximise the sum of pecuniary gains to members flowing from higher deposit rates and lower lending rates compared with other financial institutions. The maximisation process is subject to the constraint that the institutions must break even. Smith (1988) extends this formal model to include uncertainty and the effects of taxation. A problem with this approach, however, symptomatic of many formal models, is the assumption of a break-even result. Such an assumption places emphasis on the nonprofit status of credit unions at the expense of their mutuality characteristics. Formal models related to Smith's approach generally

assume a zero profit constraint, after distribution of interest rebates on loans or bonus dividends on savings (Smith, Cargill and Meyer, 1981). Such a model defines credit union behavioural constraints too narrowly.

An economic model of credit unions that takes better account of mutuality is proposed by Taylor (1971). He argues that the credit union operates for the benefit of all the members. Member welfare is achieved through minimising the difference between the credit union's deposit and lending rates. Saver welfare is increased by a higher interest or dividend rate on deposits, while borrower welfare is increased by lower interest rates on loans. The objective of the credit union is to minimise this difference, subject to covering long-run average costs. Unlike Smith's model, the maximisation of member welfare can occur through growth and reserve accumulation (Spencer, 1996), gains to scale, and by cost efficiencies. In this framework, a conflict potentially arises between members of the credit union who are principally savers or borrowers. Patin and McNiel (1991a) examine credit unions in the United States to find that, although there is evidence of some strong borrower- and saver-dominated behaviour, the most widespread behaviour observed was neutrality. Regulatory constraints may affect the allocation of benefits as between savers and borrowers. Walker and Chandler (1977) argue that dividend and loan rate ceilings for credit unions in the United States create a strong pro-borrower bias, by guaranteeing a minimum return on deposit rates and placing a ceiling on lending rates.

While Taylor's model and its extensions are useful, the major focus in

this literature is on borrower-saver conflicts. The Taylor model, as for many other formal models, fails to capture the informational features of credit unions as an important element in explaining their comparative advantages. Formal analysis ignores the role of subsidisation by sponsor organisations (such as employers) and volunteer labour (Navratil, 1981). A theory of credit union behaviour is arguably incomplete without considerations of altruistic motives (Peterson, 1981).

3.3.2 The common bond

Members of a credit union are linked by a common bond of association such as a common employer, a common social or ethnic background, or geographical location. Some argue that the essential difference between commercial banks and credit unions is to be found in the concept of a common bond (Bundt, Chiesa and Keating, 1989). It is this common bond, not merely mutuality, which distinguishes credit unions from other financial institutions (Crapp and Skully, 1985, p. 1). This section proposes a model of credit union behaviour based on the strength of the common bond as the major variable influencing organisational behaviour and comparative economic advantages accruing to the institution.

As discussed in section 2.2.3, the starting point for explaining the economic behaviour of credit unions is the lack of market-based disciplining mechanisms on management, leading to significant member-manager agency problems. In the absence of an effective common bond,

credit union managers can be assumed to act in their own interests. This is consistent with formal models that assume maximisation of managerial utility, subject to a minimum member benefit constraint (Keating and Keating, 1975a; Keating, 1979). This approach draws on Williamson's (1970, 1974) managerial discretion model of organisational behaviour. Managers exert discretion both over earnings and the proportion of earnings distributed to members as benefits. These benefits must not fall below levels which would trigger member intervention in management decisions or risk replacement by new managers (Croteau, 1963). Managers are able to spend the residue according to their personal preferences. An extreme form of this position would be the statement that, except for the obligation to pay depositors interest, a credit union manager is "otherwise free to operate the firm as he pleases" (Rasmusen, 1988, p. 397).

A common bond addresses this situation in four ways. First, the common bond reduces member-manager agency costs. Part of this explanation is based on altruism. Fama and Jensen (1983b, pp. 343-345) state that the "altruism of internal agents" allows a lower cost for control of agency problems and acts to limit the risk of expropriation. This is based on "strong tastes for an organization's outputs" on the part of managers. A credit union manager is more likely to be altruistic given a common bond of membership, which the manager is more likely to share. Social norms encouraging altruism and against profiteering will be far more developed within credit unions with a strong and effective common bond. Credit

unions are partly an "idealistic" movement, based on cooperative principles of self-help (Arneil, 1969, p. 18), and guided by altruistic principles (Flynn, Lo and Runcie, 1969, p. 133). Crapp and Skully (1985, pp. 13-15) note that in part the success of the credit union movement is in subscription to principles of cooperation:

> These unifying principles make possible a common identity and set of operating practices among the credit unions, which in turn allows for the emergence of systems and organisations to serve the needs of the credit unions, enabling them in turn to better serve their members.

According to the World Council of Credit Unions, these cooperative principles include (WCCU, 1983):

- open and voluntary membership - within the common bond of association;
- democratic control - one member, one vote;[5]
- return of surplus to members - no member or group of members should benefit at the expense of others;
- neutrality in race, religion and politics;
- services to members - to increase economic and social well being rather than to maximise profit;
- ongoing education - promotion of thrift and wise use of credit;
- co-operation among co-operatives - at local, national, and international levels; and
- social responsibility - to human and social development.

More importantly, however, the common bond provides the basis for

5 A majority voting system can also be analysed as a commitment device to guarantee maximum access to credit in those states of nature where the value of borrowers' collateral is low, since in those states of nature the poorer credit union members are likely to form a majority (Aghion, 1998). A difficulty with this argument is that it relies on substantial heterogeneity among credit union membership, which is likely to be inconsistent with the common bond.

screening, selection and socialisation processes, as discussed in section 2.4.3. The common bond is a benchmark for assessing compatibility between credit unions and members in terms of values. The homogeneity in value systems will reduce uncertainty, encourage information flows and enhance economic coordination. The ability of cooperation to reduce agency costs depends on the strength of bonding between members of an organisation (Williams, 1986, pp. 274-275). Non-conformity or deviant behaviour from group norms results in increased costs and reduced rewards for group members. This role for the common bond is distinct from agency theorists who emphasise contracting as the mechanism to provide an agent with incentives to act in the interests of the principal. Such contracting solutions typically rely on the operation of efficient markets. By contrast, this analysis stresses the search for and screening of potential agents, and expenditure by the principal on socialising the agent so that the agent's personal preferences are closer to the principal's.

Second, the common bond reinforces the relationship of mutuality, and thereby the identity of interests between members and depositors. This addresses potential conflicts between shareholders and depositors, whereby shareholders have an incentive to increase risk, as discussed in section 3.1.5. The shareholder-debtholder agency conflict is addressed since members share both roles. Davis (1994) described this situation as a form of "self-insurance" by credit union members.

Third, the common bond has an informational role. The relationship

between members of a credit union is essential in reducing the cost of gathering information relevant to screening borrowers and monitoring credit risk to reduce bad debt losses (Black and Dugger, 1981). Members participating in management with a shared common bond are more likely to know most potential borrowers and have an advantage in assessing their credit worth and potential for continued employment (Crapp and Skully, 1983, p. 40). This is consistent with the existence of screening and monitoring processes in credit markets examined in section 3.2.2. There is evidence, for example, that industrial credit unions in Australia have lower bad debts experience than community based organisations (Williams, 1986, p. 281). In an industrial-based credit union, members are also colleagues in employment. This generates pressures through the possibility that indiscretions will become known (Williams, 1986, p. 273). Loan performance can be improved by management having case histories of many loan applicants through the knowledge of the directors, by the common ability to have direct salary deductions for repayments and by the ability to secure loans by a lien over a borrower's superannuation (Williams, 1986, p. 275).

Fourth, the common bond will also be a proxy for other comparative institutional advantages (Earl, 1990, p. 174). Occupational common bonds, for example, may imply subsidy benefits such as provision of office space, availability of payroll deduction for loan repayment, data processing services and employment entitlements for volunteer workers. Bundt, Chiesa and Keating (1989) find that credit unions with a common bond of

employment had a significant cost advantage in processing deposit accounts, presumably due to benefits from the employer in terms of data processing. Credit unions with employment related common bonds might also be exposed to greater cyclical risk as the saving and borrowing habits among its members may be highly correlated. Consequently, the nature of the business of the employer might also be relevant for employment-bonded credit union performance (Kohers, 1986).

The argument that member bonding will affect behaviour is supported by empirical studies.[6] Williams (1986) found that the stronger the bonding between members, the stronger will be the bonding between members and management, and the greater the efficiency or the organisation. In his study of Australian credit unions, there was a significant relationship between common bond type (industrial or community) and credit union managers' perceptions of member cohesion. Managerial salaries were also significantly related to common bond classification, suggesting that the degree of member bonding influences the degree of divergence between member and manager interests. Similarly, Bundt, Chiesa and Keating (1989) examine whether the common bond relationship affects organisational behaviour, using a sample of credit unions in the United States. They also find that there are significant differences in behaviour across common bond types.

6 Discussed in more detail in Chapter Six.

3.3.3 Regulatory policies for credit unions

The model of credit union behaviour developed here has implications for credit union regulation. In particular, the integrity of the common bond relationship should arguably be an objective of public policy. The traditional case for government intervention is underpinned by the existence of market failure, such as the existence of externalities or information asymmetries. Government fostering of new technology, for example, has been advocated in part due to information asymmetries in respect of its capabilities and commercial value (Pandit, Swann and Watts, 1997). Credit unions constitute an institutional mechanism to address problems of information asymmetry prevalent in credit markets. On that basis, there is public benefit arising from the fostering of such institutions. Stiglitz (1993, p. 32) believes that an appropriate role for the government is to take actions which foster the establishment and support the maintenance of certain financial institutions, such as those which fill gaps in the kinds of credit provided by private institutions. Weisbrod (1988, p. 17) states that a "healthy pluralism" is a continuing goal of public policy. Australian policy makers have also recognised a need for smaller, special-purpose financial institutions serving a particular clientele with a relatively narrow range of financial products (Thompson, 1990, p. 5). Based on the analysis in this chapter, credit union regulation will support the informational and other institutional benefits where it reinforces the common bond and mutual structure. This might be assessed, for example, in the degree of consistency or conflict between credit union

legislation and cooperative principles. An appropriate public policy objective might be the insulation of credit unions from pressures to deviate from the social role they play in the modern mixed economy (Weisbrod, 1988, p. 163).

Where the common bond is weaker, there will be fewer constraints on management. This might lead to self-interested behaviour by management, which credit union members are unlikely to address. On this basis, there may be grounds for government intervention to ensure against management fraud and incompetence (Hickson and McKillop, 1996, p. 136). For example, Davis (1995, p. 51) advocates supervisory evaluation of management quality in credit unions, such as through the CAMEL[7] rating system, as well as regulation of remuneration arrangements and related party transactions.

3.4 Summary

This chapter critically examined the economic literature in respect of financial mutuals, and credit unions in particular. One perspective, property rights literature, argues that financial mutuals are inherently less efficient due to lack of clarity in definition of property rights in residual risk bearing, and lack of access to market incentives. In this context, their existence is explained by favourable legislation, taxation benefits or other

7 The CAMEL rating system was derived from the United States and takes into account: adequacy of Capital; structure and quality of Assets; quality of Management; Earnings performance; and Liquidity of assets (Campbell Inquiry, 1981, para. 19.72).

concessions. Agency theory also suggests alternative control mechanisms, including well developed decision hierarchies, internal labour markets, monitoring by the board of directors and, in the case of financial mutuals, redeemable member claims. A more convincing argument based on an agency perspective is found in the argument that mutuality eliminates the agency costs of debt. Owners who are also depositors, policyholders or borrowers have less incentive to increase the risk of the financial mutual as would a separate class of specialist risk-bearing shareholders. This reduced risk explanation was supported by the mutual manager's inherent risk aversion in the absence of market incentives.

Another perspective, based on informational advantages, finds that significant problems of adverse selection and moral hazard exist within financial intermediation. This is supported by an examination of rural credit markets within developing countries. Moneylenders with local knowledge and engaging in extensive screening processes have significant informational advantages over formal institutional lenders. The role of financial mutuals, given these problems, is to harness the private knowledge of its members to eliminate the high cost of screening and monitoring incurred by outside lenders. Rotating savings and loan associations, or *tontines* in developing nations illustrate the advantages in terms of screening and monitoring accruing to small groups coupled with associated social sanctions. The development of the Grameen bank, German credit cooperatives, and mutual banks and savings and loan associations in the United States, is consistent with the comparative

advantages of these organisations in dealing with information asymmetry.

Formal models of credit union behaviour generally assume simple objective functions such as cost minimisation subject to exogenous demand or maximisation of manager benefits. A preferred approach emphasises the common bond as the important factor influencing credit union operating decisions. The basic model is one of maximisation of manager utility, moderated by the strength of the common bond. The common bond also provides a basis for altruistic behaviour as a control on management self-interest. The common bond of association reinforces mutuality, and explains the degree of social distance between members, enhancing screening and monitoring. This explanation of credit unions is preferable to formal models of credit union behaviour that rely on simple cost minimisation or other objective functions, which do not capture the more essential economic features of a credit union. My claim is that the comparative economic advantages of the credit union more directly emerge from the common bond relationship than any other institutional feature. In the context of this theoretical model of credit union behaviour, Chapters Four and Five analyse the regulatory changes within the FI Scheme, to assess the impact on Australian credit unions. This is followed in Chapters Six and Seven by an empirical study of the impact of the Scheme.

Chapter Four
Credit Union Regulation

This chapter discusses the evolution and content of credit union legislation in Australia. In order to assess the impact of the Financial Institutions Scheme (FI Scheme) it is necessary to examine the changes introduced by the Scheme relative to the previous regulatory framework. The analysis demonstrates that the significant change was the application of Reserve Bank prudential supervision mechanisms to all non-bank financial institutions, and in particular a capital adequacy requirement. This policy approach can be explained by the philosophical view that competitive neutrality across financial institutions is desirable - a position emerging from the Campbell Inquiry and later endorsed by the Brady committee. The chapter therefore begins with a brief overview of the approach to banking regulation emerging from Campbell, followed by a detailed description of the legislative position before the creation of the Australian Financial Institutions Commission (AFIC). Later, the evolution of the FI Scheme and its content provide the basis for analysis of the regulatory changes. Given the theoretical framework developed in the preceding chapters, the legislative analysis has particular focus on the issue of mutuality, such as membership rights and governance arrangements. Also highlighted are prudential mechanisms and supervisory arrangements.

4.1 Banking Regulation after Campbell

A major consideration of financial institutions policy at a national level was the Campbell Inquiry (1981). The Inquiry was the first general survey of the financial system conducted since a Royal Commission on Money and Banking in 1936. A recurring theme of the Inquiry is that government intervention in the financial system had not achieved its intentions in terms of value for money, efficiency, or in assisting particular sectors of the economy (Perkins, 1982). The Campbell committee applied a clear ideological preference for the market mechanism and combined this with a set of recommendations unrestrained by political considerations. The Campbell committee asked that "more confidence be placed in the disciplines and processes of the market" (1981, para. 16). As Porter (1982) observes:

> If there is a "flaw" in the Report it is perhaps the single-minded consistency with which the authors have adhered to their pursuit of economic efficiency.

The philosophy of the Campbell Committee's recommendations is principally that the financial sector be subject to minimal government interference (Valentine, 1991, p. 37). Deregulation is predicted to support greater allocative, operational, and dynamic efficiency. The committee recommended the removal of direct controls over bank intermediation behaviour or portfolio composition as a prudential mechanism (1981, para. 19.61). In particular, interest rate controls should be abolished (para. 19.127).

Coupled to the deregulation of operational controls over banking were recommendations for new prudential supervision arrangements. The system of prudential control endorsed by the Campbell committee had the following principal characteristics (Valentine, 1991, p. 40):

- competitive neutrality;
- introduction of a risk-weighted variable capital ratio; and
- retention of liquidity requirements.

The Campbell committee adopted the view that competitive neutrality - a major philosophical objective - would best be achieved through a "functional approach" to regulation. This is a policy of applying a uniform regulatory response to all deposit-taking activities, irrespective of the type of institution. Competitive neutrality involves regulating intermediaries undertaking similar financial activities in a consistent manner (1981, para. 18.38). The committee stated (para. 19.15, emphasis in original):

> Competitive neutrality would best be achieved through a more *functional approach* to the regulation of DTIs. This involves a consistent approach to the regulation of all deposit-taking activities.

The committee followed the lead of overseas jurisdictions (such as the United Kingdom) in recommending the use of minimum capital requirements as a prudential device. The capital adequacy approach is part of an international movement, centred in the Bank for International Settlements, aimed at making prudential controls consistent across

participating developed countries (Perkins, 1989, p. 68). These requirements represent a major worldwide convergence of regulation with the aim of international competitive neutrality in the financial sector (Pecchioli, 1989, p. 23). Australia can be regarded as a case of conservative adaptation of the Bank for International Settlements guidelines (Ferguson, 1991, p. 156). The initiation by the Reserve Bank of the capital adequacy mechanism as a major part of its prudential strategy implements the *Basle Concordant* of July 1988.

Concern by the Reserve Bank in respect of appropriate capital requirements also derives from its own research in 1974 which found that capital ratios in Australia were low relative to a number of overseas banks (Thompson, 1991, p. 117). Although no formal requirements were put in place, Australian banks were persuaded by the Reserve Bank to maintain capital ratios of 5% by the end of the 1970s. In the United States, federal regulators imposed capital requirements to address a similar slide in capitalisation during the 1970s (Wall and Peterson, 1987; Marcus, 1983). Concerns over capital adequacy have a long history. The capital adequacy of early Australian trading banks declined steadily over a two decade period before 13 of the 22 note-issuing banks failed in the period January to May 1893 (Merrett, 1989).

Capital adequacy is applied to a bank's consolidated balance sheet, including off-balance sheet business. Total capital must be held at a minimum percentage of the risk-weighted value of the bank's assets, of which a prescribed percentage must be "core" or "Tier 1" capital, in the

form of paid-up ordinary shares, general reserves and retained earnings, non-cumulative irredeemable preference shares and minority interests in subsidiaries. The remaining "supplementary" or "Tier 2" capital includes provisions for doubtful debts, subordinated debt, asset revaluation reserves, and cumulative irredeemable preference shares. At most, Tier 2 capital can represent 50% of the total capital requirement (Perkins, 1989, pp. 69-70). Risk weightings are calculated by broad rating categories of zero (liquid assets), 10% (State government securities), 20% (other public sector securities, claims on banks), 50% (residential mortgage loans) and 100% (all other claims).[8] Implementation of the risk-adjusted capital adequacy requirement for banks was announced on 23 August 1988, with the minimum requirement set at 8%, and was made effective from September 1988 (Hogan and Sharpe, 1990, p. 180; Hogan, 1989).

Following Campbell, the banks were also introduced to new liquidity regulations in the form of the Prime Assets Ratio (PAR). Evolved from the LGS (Liquid asset and Government Securities) ratio, the PAR ensured that the banks kept a sufficient proportion of their assets in a highly liquid form to minimise the risk of illiquidity. The major difference was a more broadly denominator which covered *all* non-capital liabilities, and not merely deposit liabilities (Martin Report, 1991, para. 12.14).

The discussion in the following sections demonstrates that both the

8 For a more detailed description of the capital adequacy requirement, see Martin Report, 1991, Appendix 8 and Davis, 1990, Appendix 1).

capital and liquidity requirements were applied to non-bank financial institutions in the same manner as for banks.

4.2 Pre-Scheme Legislation

Credit union legislation in Australia evolved from general statutes regulating cooperatives. These acts included:

- *Building and Co-operative Societies Act* 1901 (NSW);
- *Co-operative and Provident Societies Act* 1903 (WA);
- *Industrial and Provident Societies Act* 1923 (SA);
- *Co-operation Act* 1923 (NSW);
- *Co-operative Societies Act* 1946 (Qld);
- *Co-operation Act* 1961 (Vic);
- *Co-operative and Other Societies Act* 1967 (Qld);
- *Co-operative Societies Act* 1976 (NT).

In Victoria, Tasmania, and the Australian Capital Territory (ACT), the legislation before the FI Scheme remained based on Acts governing cooperatives more generally:

- *Co-operation Act* 1981 (Vic);
- *Co-operative Industrial Societies Act* 1928 (Tas);
- *Co-operative Societies Act* 1939 (ACT).

Specialist credit union statutes emerged with the Parliament of New South Wales (NSW) passing the *Credit Unions Act* 1969. This approach spread to Queensland, South Australia (SA), Western Australia (WA) and the Northern Territory (NT) over the 1970s and 1980s:

- *Credit Unions Act* 1976 (SA);
- *Credit Unions Act* 1979 (WA);
- *Credit Unions Act* 1982 (NT);

- *Credit Societies Act* 1986 (Qld);
- *Credit Unions Act* 1989 (SA).

In the ACT, the use of a general cooperative statute meant that credit unions were a form of "trading society" (s. 13(d)), with extended powers to receive money on deposit (s. 16A(1)(b)). The objects of such trading societies were stated at a high level of abstraction:

> . . . to do all such other things calculated to promote the economic interests of its members in relation to the objects mentioned as are prescribed.

In Victoria, a "credit society" was a specialised form of cooperative under the Act, akin to a credit union (s. 16(c) and (d)). The objects of a credit society were, *inter alia*:

> . . . to encourage habits of thrift among its members; and to promote co-operative enterprise and to provide programmes or services to its members as prescribed by the rules for assisting its members to meet their financial or social needs.

Such encouragement of thrift amongst membership reflects the history of the movement, as discussed in earlier chapters. The clause is consistent with specialised statutes in NSW and WA, where the encouragement of thrift was supported specifically (NSW s. 4(c); WA s. 6(c)).

The provision of services to members was also a common theme, as illustrated by the NT Act (s. 13(c)):

> . . . to provide such advice and services for its members as in the opinion of its board may assist its members to meet their financial needs and obligations.

The objects as stated in specific legislation, such as in NSW, reflected the

intermediation activities of credit unions (s. 4):

> 4. The objects of a credit union shall be –
> (a) the raising of a fund by subscriptions of its members and in any way authorised by this Act;
> (b) making loans from that fund to its members as provided by or under this Act and the rules of the credit union; and
> (c) to encourage habits of thrift among its members.

The SA laws, for example, required a credit union "to operate as a financial co-operative" (s. 10(a)). In Victoria, the objects of a co-operative society included an obligation to "promote co-operation for the improvement of the conditions of rural or urban life" (s. 6(3)). In the ACT a society might, if authorised by its Rules, apply an amount not exceeding 10 per cent of the surplus arising in a financial year of the society from the business of the society to a charitable purpose or for promoting community cooperation and advancement (s. 23(4)). A similar but less limited provision exists in the NT (s. 55(4)).

As a matter of consumer protection, there were provisions dealing with the use of names. In WA, for example, credit unions must include the words "credit union" in their name (s. 29). This was coupled with a prohibition on other organisations using these words (s. 30). In Queensland, Victoria and NT, the prohibited words included "credit society" as well as "credit union" (Qld s. 25; Vic s. 54(2); NT s. 36(1)). In Victoria, Tasmania and ACT, the word "co-operative" was included in the mandate and prohibition (Vic s. 54(6); Tas s. 5(5); ACT ss. 32(2) and 40). In SA the prohibition was on the carrying on of the business of a credit union by an unregistered organisation (s. 9).

4.2.1 Mutuality

The prior chapters discussed the comparative economic advantages of mutual organisations and, in particular, how the integration of consumer and producer interests ameliorated information asymmetry problems. This organisational structure is supported by screening, selection and socialisation processes, which reinforce cooperative social norms. The cooperative values of these organisations provide a degree of homogeneity, which facilitates information flows and address potential member-manager agency problems. An issue for examination is the degree to which the legislation in respect of credit unions supports the mutual organisational structure or reduces agency costs.

The specific provisions in respect of credit union governance arrangements before the FI Scheme were generally consistent with the reinforcement of the character of mutual organisations and the cooperative principles of the movement. In NSW, Queensland, SA, W A and NT, shares could not be transferred without the consent of the board of directors (NSW s. 43(8); Qld s. 51(5); SA s. 26(8); WA s. 45(5); NT s. 49(9)). This is consistent with the pairwise identity of the parties being an important element of the social relationship. This requirement was reinforced in respect of parties to whom loans could be made. In most States and the ACT, credit unions were restricted in making loans to members as specified in their rules (NSW s. 6; Qld s. 64(1); Vic s. 18; SA s. 41; WA s. 54; Tas s. 36(1); ACT, s. 15; NT s. 57(1)). In NSW, loans could only be granted to individuals who were members of the credit union,

and also members of a class in a special rule (s. 6(1)). That class could be limited by geographic area (s. 6(2)). Similarly, in WA, eligibility could be based on residence in a particular district or by membership of a special rule class (s. 54(2)). In the ACT (due to the broader nature of the legislation), unless it was otherwise provided by the rules, every person was qualified to become a member (s. 15(2)). On the other side of intermediation, a credit union could only accept deposits from members in SA (s. 37).

The rules regarding directors address member-manager agency problems. A director must be a member of the credit union (NSW s. 55(1)(a)(i); Qld s. 75(1); Vic s. 104(1); SA s. 65(2)(c); WA s. 65; ACT s. 51(7)). In the NT, the director must also be a resident Territorian (s. 67(1)). In NSW, WA and NT, there was limit of one employee on the board of directors, who could not be elected chairman (NSW s. 54; WA s. 64(9); NT s. 66(9)). In SA, an employee was disqualified from being a director (s. 65(1)). A general prohibition applied to the payment of fees to directors. Such fees could only be approved by a general meeting of members (NSW s. 58(1); Qld s. 80(1); Vic s. 107(2); SA s. 68; WA s. 73; ACT 55(1); NT s. 73). In WA, ACT and NT, a director or other officer should not borrow except in pursuance of a special resolution (WA s. 72A; ACT s. 55(1); NT s. 77(3)). In SA, this approval could be by majority of directors (s. 67(1)(a)). In Queensland, reasonable travelling expenses might be paid (s. 80(2)). Moreover, in NSW the Credit Union Advisory Committee (appointed by the Minister under s. 101) could set a cap on director fees (s. 58(2)). In Victoria, a cap

was determined by Regulations (s. 107(3), and in WA, such a cap was approved by the Minister (s. 73(2)).

There is evidence of the reinforcement of democratic principles of governance in the legislation. Irrespective of the rules of the credit union, in NSW, Victoria, WA and ACT no member could hold more than 20% of the share capital (NSW s. 43(6); Vic s. 59(9); WA s. 46(1); ACT s. 22(6)). In Queensland and NT, each member must hold the same number of shares (Qld s. 52; NT s. 49(4)). This ensured that no individual should have disproportionate influence over operating decisions. In NSW, Queensland, Victoria, SA and WA voting could not be undertaken by proxy (NSW s. 62(1A); Qld s. 90(2); Vic s. 111(6); SA s. 73(9); WA s. 79(7)). In Tasmania, ACT and NT this prohibition applied only unless proxies were permitted by the rules (Tas s. 45(1); ACT s. 53(6); NT s. 79(1)). Prohibition of voting by proxy prevents an individual from disproportionate influence at meetings by exercising proxies.

Voting must be based on one-member-one-vote (NSW s. 62(2); Qld s. 90(3); SA s. 24(1); WA s. 79(8); Tas s. 4(2); NT s. 79(2)). In the ACT, on a poll held at a general meeting, a member was entitled to an additional allotment of 1 or 2 votes, where the rules so provide, on the basis of the value of goods purchased by the member during the preceding financial year (s. 53(2)). The rules of an individual society determined the number of votes able to be cast in Victoria (s. 111(3)). The one-member-one-vote rule is consistent with the democratic character of the mutual within the aims of the credit union movement.

4.2.2 Prudential requirements

Prudential supervision of financial institutions has two basic objectives, broadly to promote stability in the financial system, and more specifically to protect the interests of depositors of a particular institution. This philosophy derives from the 1937 Royal Commission on Monetary and Banking Systems (Thompson, 1991, p. 115). One prudential mechanism was the reduction of loan-specific risks. In NSW, a maximum of $5000 could be lent unsecured, and a maximum of 1% of the value of the credit union's assets if secured (s. 6(7)). In Queensland, the maximum loan size, irrespective of security, was $10,000 or 1% of withdrawable funds, whichever was greater (s. 65). In SA, WA and NT, credit unions were limited to a maximum amount which could be lent for unsecured and secured loans, by directions from the Minister, the Registrar and by Regulations, respectively (SA s. 41; WA s. 55; NT; s. 58). In Tasmania, the rules of the individual societies determined the basis on which loans could be made (s. 36(2)). In SA, additional restrictions were placed on commercial loans as a proportion of the credit union's portfolio (s. 45).

Gearing limitations were applied. In NSW, SA, WA and NT, money could not be raised by way of loan in excess of 25% of members' funds (share capital and deposits) within a period of one month (NSW s. 12(4); SA s. 38; WA s. 10(4); NT s. 16(3)). The ACT had complex gearing requirement for bonds issued or deposits taken from non-members (s. 36(2)). An ACT society could not borrow more than $2,000 without a special resolution of the society (s. 36(5)). Tasmania had no such

restrictions (s. 36(2)).

The forms in which credit unions could invest surplus funds was regulated. The NSW Act, for example, listed securities for investment of surplus funds (s. 19):

- securities authorised for investment of trust funds;
- mortgages of real estate, where permitted by regulation;
- deposits with banks, permanent building societies, and credit union associations;
- shares up to a limit of $10,000; and
- other prescribed securities.

Such a list was typical of investment requirements in other jurisdictions (Qld s. 57; SA s. 51; WA s. 51; ACT, s. 37; NT s. 54).

The legislation imposed prescribed liquidity ratios and reserve requirements, analogous to LGS (Liquid Asset and Government Securities) requirements imposed on banks. Credit unions were subject to liquidity requirements, whereby a prescribed percentage of share capital and deposits are to be held as liquid assets (the definition of which varied between jurisdictions). The proportion ranged from 7% to 10%. This was supported by a prohibition on issuing loans which would breach this requirement (NSW s. 7; Qld s. 69; Vic s. 18(5); SA s. 47; WA s. 60; ACT s. 81 Regulations; NT s. 63).

Reserves were required to be appropriated, typically based on a portion of

the surplus, until a reasonable level of reserves were reached. In NSW and NT, the size of the appropriation was on the basis of the "mean balance of assets", the average of the current and preceding year's assets (NSW s. 50(1)(a); WA s. 61(4); NT s. 64(1)(a)). Credit unions were required to transfer from the annual operating surplus 0.5% of the mean balance of assets to a reserve until the reserves amounted to 5% (or in NT, 7.5%) of the mean balance of assets (NSW s. 50; NT s. 64(1)). In WA, credit unions were required to appropriate reserves until "net worth" was equal to at least 5% of "mean assets" (s. 61). In Victoria, 5% of the surplus in any year is transferred to a reserve fund until the fund represents 25% of capital, deposits and borrowings (s. 60(1)). In SA, reserves were maintained at 5% of total assets, measured over a three-year cycle (s. 48(3)). Reserves included any share capital ranking below deposits, capital gains over the period (both realised and unrealised) and revenue profits appropriated to a statutory reserve account (s. 48(1)). In Queensland and the ACT, the appropriation was 0.3% of the withdrawable funds. The required reserve amount was 3% (ACT, 2.5%) of the withdrawable funds (Qld s. 70(11); ACT s. 22A). Reserves so accumulated were protected from distribution (NSW: s. 50(5); Qld s. 70(7); Vic s. 60(2); SA s. 48(7); WA s. 61A; ACT, s. 22A(6); NT s. 64(6)).

4.2.3 Solvency and supervision

In NSW, the Credit Union Savings Reserve Board administered a fund that provided financial assistance to NSW credit unions (ss. 69L-69W).

The fund was established by compulsory requirements that 0.75% of share capital and deposits be held in the fund. Similar arrangements existed in Queensland by the Guarantee Fund (ss. 139-160); in Victoria by the Credit Societies Guarantee Fund (ss. 21-29); in SA by the Credit Union Deposit Insurance Fund (ss. 100-117); and in WA by the Credit Unions Savings Protection Fund (ss. 104A-104M). In NT, a power conferred on credit unions included the ability to join a mutual aid stabilisation fund approved by the Minister (s. 14(d)).

Credit unions had industry-based solvency support arrangements. The Australian Federation of Credit Unions Leagues Ltd (AFCUL) was formed to represent the interests of credit unions. This organisation offered centralised clearing and liquidity support facilities. AFCUL and State associations, such as the Queensland Co-operative Credit Union League, also developed stabilisation and reserve schemes for credit unions,

Registrars had wide powers to inspect credit unions and require returns (typically quarterly). In the ACT, the Registrar could inspect books, documents or records (s. 5B), require further evidence as to the compliance with the Act (s. 6), and if requested by the board or one third of the members, conduct an inquiry (s. 7). With the approval of the Minister, the Registrar could suspend part or all of the operations of the society (s. 58A), appoint an administrator (s. 58B), or have the society wound up (s. 59). Similar actions by the relevant statutory authority are authorised in Victoria, SA, WA, Tasmania and NT (Qld ss. 128-138 and 186-199; Vic Parts 5, 8, 9 and 10; SA ss. 5-8; WA ss. 97-104; Tas ss. 19-20A,

Table 4-1 – Comparative Table of pre-Scheme Credit Union Acts

	New South Wales	Queensland	Victoria	South Australia	Western Australia	Tasmania	ACT	NT
Previous Acts	*Building and Co-operative Societies Act* 1901; *Co-operation Act* 1923	*Co-operative Societies Act* 1946; *Co-operative and Other Societies Act* 1967	*Co-operation Act* 1961	*Industrial and Provident Societies Act* 1923; *Credit Unions Act* 1976	*Co-operative and Provident Societies Act* 1903	–	*Building and Co-operative Societies Act* 1901 (NSW)	*Co-operative Societies Act* 1976
Pre-AFIC Act	*Credit Union Act* 1969	*Credit Societies Act* 1986	*Co-operation Act* 1981	*Credit Unions Act* 1989	*Credit Unions Act* 1979	*Co-operative Industrial Societies Act* 1928	*Co-operative Societies Act* 1939	*Credit Unions Act* 1982
Mutuality								
Loan restricted to members	s.6(1); class specified by special rule	s. 64(1)	s. 18	s. 41	s. 54(2); district or special rule	s. 36(1)	–	s. 57(1)
Director must be member	s. 55(1)(a)(i)	s. 75(1)	s. 104(1)	s. 65(2)(c)	s. 65(1)(a)	–	s. 51(7)	s. 67(1); and a resident Territorian
Directors not to be paid	s. 58(1)	s. 80(1)	s. 107(2)	s. 68	s. 73(1)	–	s. 55(1); loans not to be made	s. 73
No member to hold more than 20%	s. 43(6); share capital	s. 52; each member holds same number of shares	s. 59(9); subscribed shares	–	s. 46(1); subscribed capital	–	s. 22(6); shares, including withdrawable shares	s. 49(4); each member holds same number of shares

No proxies	s. 62(1A)	s. 90(2)	s. 111(6)	s. 73(9)	s. 79(7)	s. 45(1); unless permitted in rules of society	s. 53(6); unless permitted in rules of society	s. 79(1); unless permitted in rules of union
One member one vote rule	s. 62(2)	s. 90(3)	s. 111(3); except for rules	s. 24(1)	s. 79(8)	s. 4(2)	s. 53; plus 1 or 2 votes	s. 79(2)
Prudence								
Loans limited in size	s. 6(7); $5000 if unsecured, or 1% of assets if secured	s. 65; $10,000 or 1% of withdrawable funds	–	s. 43; fixed by the Minister	s. 55; directions from Registrar	s. 36(1); only by rules of individual societies	s. 81; by way of Regulations	s. 58; by way of Regulations
Gearing	s. 12(4); no more than 25% of capital and deposits in single month	–	–	–	s. 10(4); no more than 25% of capital and deposits in single month	s. 36(2); no restriction on borrowing from non-members	s. 36(5); no more than $2,000 without a special resolution	s. 16(3); no more than 25% of capital and deposits in single month
Investment of surplus funds	s. 19	s. 57	–	s. 51	s. 51	–	s. 37	s. 54
Liquidity	s. 7; 7% of share capital and deposits	s. 69; 7.5% of share capital and deposits	s. 18(5); 7% of capital, deposits and loans	s. 47; 7% of share capital and deposits	s. 60; 10% of withdrawable shares and deposits	–	s. 81; 10% of withdrawable shares	s. 63; 9% of withdrawable funds
Reserves	s. 50; transfer 0.5% mean balance of assets until 5%	s. 70(11); transfer 0.3% withdrawable funds until 3%	s. 60(1); 5% of surplus until 25% of capital, deposits and borrowings	s. 48(3); shares, capital gains and reserves must be 5% of assets	s. 60; maintain net worth at 5% of mean assets	–	s. 22A; transfer 0.3% of withdrawable funds until 2%	s. 64; transfer 0.5% mean balance of assets to 7.5%

Solvency and Supervision								
Solvency support schemes	ss. 69L-69W; Credit Union Savings Reserve Fund	ss. 139-160; Guarantee Fund	–	ss. 100-117; Credit Union Deposit Insurance Fund	ss. 104A-104M; Credit Unions Savings Protection Fund	–	–	s. 14(f); may join a mutual fund approved by the Minister
Supervision	ss. 69X-69AE	ss. 128-138 and 186-199	Parts 5, 8, 9 and 10	ss. 118-126	ss. 97-104; and ss. 104N-104ZA	ss. 19-20A, 51A and 52	ss. 5A-7; 58A-62	ss. 107-113

51A and 52; NT ss. 107-113).

The relevant stabilisation and reserve fund boards exercised extensive powers of supervision over credit unions. In NSW, the Credit Union Savings Reserve Board could make rules restricting the operation of credit unions, with powers to wind them up in cases of contravention (ss. 69X-69Z). More generally, the Board could place credit unions under direction, bringing into play additional supervisory powers such as appointing their own auditors (ss. 69AA-69AE). Similar powers applied in Victoria (ss. 30-43); SA (ss. 118-126) and WA (ss. 104N-104ZA).

The differences in State and Territory laws over the important areas of concerns are presented in Table 4-1.

4.3 The Brady Report

While the major focus of the Campbell Inquiry was on banks, recommendations were also made in respect of "non-bank deposit-taking institutions" or "DTIs" - predominantly building societies and credit unions. Consistent with the approach for recommendations on banks, Campbell argued for a philosophy of "flexible regulation" - where DTIs are permitted considerable freedom in respect of operational decisions, subject to prudential requirements - rather than "structural regulation", in the form of interest rate controls and portfolio restrictions (para 19.15). Accordingly, the Report recommended that non-bank DTIs should be unrestricted in the range of lending they may undertake and investments they may hold (para 19.198); should not be subject to restrictions on the

maturity of their investments (para. 19.200); should have no notice-of-withdrawal requirements (para. 19.220); and should not be subject to interest rate controls (para. 19.222).

Based on the philosophical objective of competitive neutrality, the approach adopted for banking regulation, according to the Campbell committee, should be extended to other deposit-taking intermediaries (para. 1918). This would be achieved under a nationally uniform framework through State and territory cooperation (para. 19.24). The clear intention of the committee was to have a national scheme covering building societies and credit unions to eliminate the distortions resulting from differences in State prudential regulation (Perkins, 1982, p. 75). Direct controls over non-bank financial intermediaries by the Commonwealth were not implemented due to concerns regarding Constitutional limitations of the federal Parliament (Perkins, 1989, p. 74). State regulations of building societies and credit unions therefore continued to apply, although in a manner that varied between the states (Campbell Inquiry, 1980, para. 3.29). Marked differences developed between States in respect of credit union regulation and the amount of resources devoted to supervision (Martin Report, 1991, para. 12.58). As discussed above, some States were characterised by separate legislation for each type of non-bank entity. In others, omnibus statutes covered a range of financial institutions. Inconsistencies were particularly significant in respect of coverage of friendly societies and agricultural cooperatives within the relevant Registrar offices. The Martin Report (1991, para.

12.63) notes that the prudential guidelines which would apply to financial institutions under the AFIC arrangements were "likely to follow those applied by the Reserve Bank to banks". Indeed, the importance of capital requirements - the "linchpin of prudential regulation" is emphasised and supported by the Martin committee (paras. 13.5 and 13.8).

In April 1990, the Queensland Government initiated an independent inquiry to review non-bank financial institutions, including building societies, credit societies, friendly societies, cooperative housing societies and trustee companies. The need for a review was based principally on public concern following the collapse of the Pyramid Building Society group in Victoria (Brady Report, 1990, p. 2), and associated problems with institutions such as Tricontinental, the State Bank of South Australia, Moe Credit Union, and the West Australian Teachers' Credit Society (Windt, 1990, p. 31). The Queensland Treasurer appointed John Brady, former Head of Supervision of the Reserve Bank of Australia to chair the committee. The Prime Minister placed the issue of non-bank financial institution regulation on the agenda of a Special Premiers' Conference on 30 October 1990, with a view to creating a national regulatory framework. The committee produced an Interim Report immediately before this Conference. The final Report was issued later the same year.

The Brady committee clearly favoured the adoption of prudential rules consistent with those applying to banks, citing the emergence of internationally agreed standards of supervision in the banking sector as best practice (1990, p. 3). The committee firmly believed the application of

Reserve Bank style supervision as being the appropriate manner in which DTIs should be regulated (1990, pp. 81-82).

The basic theme of the Brady Report was deregulation of DTI activities but increased prudential standards and supervision processes, in line with the post-Campbell changes to the banking sector (1990, p. 79). Due to concerns about the risks involved in self-regulation with a highly concentrated industry, the committee argued that prudential oversight should be undertaken through official supervision, although the supervisory body should be independent from Government (1990, pp. 80-81). Brady recommended (1990, pp. 83-84):

- adoption of a Reserve Bank style of supervision with explicit minimum prudential standards in respect of capital adequacy and liquidity, backed up by a range of informal supervisory procedures;
- appropriate modification of the details of this approach to take account of the differences between banks and DTIs; and
- within this style, a uniform supervisory approach to existing groups of DTIs.

All DTIs would be supervised by an independent statutory authority funded from DTIs themselves (Brady Report, 1990, pp. 85-88). The committee also believed national consistency to be important, and recommended this be achieved by way of concurrence of the other States in adopting consistent prudential standards and the establishment of a

national advisory body (1990, p. 85). The preference for a State-based approach for regulation of non-bank financial institutions rather than a federal approach was principally related to concerns that direct regulation by the Commonwealth might be constitutionally invalid.

The Brady Report triggered further proposals for a national supervisory scheme. A Working Group was formed comprising officials from the Commonwealth, States, Territories and the Reserve Bank. This group produced a draft agreement titled "Proposals for Reform of the Supervisory Structure for Non-Bank Financial Institutions" in April 1991. Heads of Agreement were endorsed at a Premiers' Conference in Canberra on 31 May 1991, including the principal goal of "a system of State-based prudential supervision of permanent building societies and credit unions with national co-ordination of high uniform standards and practices". At the Premiers' Conference in Adelaide on 21 and 22 November, 1991, the Financial Institutions Agreement was signed, finalising the details of the scheme, including initial prudential standards (Gray, 1993).

4.4 The Financial Institutions Scheme

The legislative approach for the FI Scheme is described as a cooperative or "template" model (Stanford and Beale, 1995, pp. 130-131). Under this arrangement, the laws of one State are taken as a template and applied to other Australian jurisdictions, such that amendments in the enacting State automatically carry to the other States. For the FI Scheme, the template was enacted by the Queensland Parliament.

4.4.1 Legislation

The following represent the major elements of the Queensland model legislation:

Australian Financial Institutions Commission Act 1992 (AFIC Act)

Australian Financial Institutions Commission Regulations 1992

Financial Institutions (Queensland) Act 1992 (FI Act)

Financial Institutions (Queensland) Regulations 1992

Financial Institutions (Queensland) Transitional Provisions Act 1992

The Australian Financial Institutions Commission Code (AFIC Code) itself is enacted under s. 21 of the AFIC Act, while the Financial Institutions Code (FI Code) is set out in s. 30 of the FI Act. Taking this legislation as a template, each State applies the Australian Financial Institutions Commission Code (AFIC Code), the Australian Financial Institutions Commission Regulations (AFIC Regulations), the Financial Institutions Code (FI Code) and Regulations (FI Regulations) as if they were laws of that State. Collectively, these laws are described as the "scheme legislation" of the relevant State. This was achieved by passing up to three pieces of State legislation:

- an Act import the scheme legislation;[9]

[9] *Financial Institutions (NSW) Act* 1992; *Financial Institutions (Victoria) Act* 1992; *Financial Institutions (Application of Laws) Act* 1992 (SA); *Financial Institutions (WA) Act* 1992; *Financial Institutions (Application of Laws) Act* 1992 (Tas.);

- an Act to establish the State Supervisory Authority (SSA);[10] and
- an Act to deal with transitional arrangements and older statutes.

The State-based importing legislation followed a standard template. After preliminary commencement and interpretation provisions (ss. 1-4) each State Act: imported the AFIC Code (s. 5), the AFIC Regulations (s. 6), the FI Code (s. 8) and FI Regulations (s. 9); adjusted some definitions to suit the local jurisdiction (ss. 7 and 10); conferred functions and powers on AFIC (s. 11) and the Australian Financial Institutions Appeals Tribunal (s. 12); conferred jurisdiction on the Supreme Court of Queensland for appeals and referrals of questions of law (s. 13);[11] designated the relevant local statutory authority as the State Supervisory Authority (s. 14); bound the Crown (s. 15); and authorised the imposition of fees (s. 16) and levies (s. 17). All States and Territories had passed the appropriate laws by the deadline of 1 July 1992, the date of commencement of the FI Scheme.

4.4.2 AFIC Code

The AFIC Code (and its supporting legislation in Queensland, the AFIC Act) establishes AFIC (s. 14), the appeals tribunal (s. 64), and the structure

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Financial Institutions (NT) Act 1992; *Financial Institutions (Application of Laws) Act* 1992 (ACT).

10 *Financial Institutions Commissions Act* 1992 (NSW); *Queensland Office of Financial Supervision Act* 1992; *South Australian Office of Financial Supervision Act* 1992; *Western Australian Financial Institutions Authority Act* 1992; *Tasmanian Office of Financial Supervision Act* 1992; *Financial Institutions (Territory Supervisory Authority) Act* 1992; *Financial Institutions (Supervisory Authority) Act* 1992 (ACT).

11 Now repealed.

for prudential regulation. Under s. 9(1) of the AFIC Code, the principal objects of the FI Scheme are:

> (a) to protect and promote the financial integrity and the efficiency of the State-based fiscal bodies system; and
>
> (b) to protect the interests of depositors.

An important principle of supervision, according to the AFIC Code (s. 10(1)(b)) is:

> Responsibility for the financial success and viability of fiscal bodies rests with their boards and management, not with government or supervisors.

Supervision should be aimed at the prevention of problems; be based on prudential standards and reporting and disclosure requirements; and operate through monitoring, external auditors, reviews of policies and performance with directors, and on-site inspections (s. 10(1)(d)).

AFIC is responsible for the establishment of overall supervisory guidelines and has responsibility for the following principal objectives of the Scheme (s. 15):

- promotion of financial integrity and efficiency;
- development of prudential and supervisory standards;
- information dissemination, including collection of statistics;
- registration and supervision of special service providers;
- supervision of industry funded liquidity support; and
- provision of advice to the Ministerial Council.

These functions are similar to those under s. 10 of the *Reserve Bank of Australia Act* 1959 (Cth), and endow AFIC with power to operate using a Reserve Bank style of supervision (Beale and Stanford, 1994, pp. 11-13). Consistent with policies in respect of the Reserve Bank, AFIC is not subject to direction by the Government (s. 18). The AFIC Board consists of up to 8 persons nominated by the Ministerial Council (MINFIN),[12] plus the Executive Director nominated by the AFIC board (ss. 24, 131 and 134). The Board has power to make standards, including prudential standards, principally in respect of (s. 28):

- the business and affairs of credit unions;[13]
- industry funded liquidity support arrangements; and
- supervision of credit unions by State supervisory authorities.

State Supervisory Authorities (SSAs) are regulated by the FI Code. SSAs are responsible for implementation of the guidelines set by AFIC. A list of SSAs by State and Territory jurisdiction is presented in Table 4-2. Under the FI Code, SSAs are established (s. 66):

- to register, supervise and regulate credit unions;
- to supervise and enforce compliance with the FI Code and AFIC

12 Two of these directors are nominated by the Interstate Consultative Committee, which comprises one representative of each SSA (Financial Institutions Agreement, clause 601).

13 The AFIC Code and FI Code refer either to "societies" (building societies, credit unions and other deposit taking financial institutions) or "fiscal bodies" (which also includes friendly societies. In this discussion of the FI Scheme legislation, the words

standards;

- to provide effective and efficient prudential supervision;
- to protect the interests of members of depositors;
- to administer funds established under the FI Code;
- to facilitate or direct transfers of engagements, conversions and mergers of credit unions;
- to administer and enforce the FI Scheme in respect of financial institutions;
- to provide information and statistics to AFIC; and
- to advise and make recommendations to AFIC.

Supervision is funded by the industry through a Supervision Levy, set in consultation with industry bodies and financial institutions (ss. 94-96). Special Service Providers (SSPs) fall under the AFIC Code, and must be registered with AFIC (s. 26). SSPs must be controlled by the financial institutions and are principally responsible for providing treasury management services, receiving deposits, investing funds in liquid assets, providing loans, and establishing lines of credit (s. 36(2)). The FI Code applies to SSPs as if they were credit unions regulated by the FI Code, and AFIC was the SSA for that institution (s. 40). On the introduction of the Scheme in 1992, the responsibilities of AFCUL and other State and Territory credit union associations were centralised into a national

"credit union" will be used to reflect the relevant context.

servicing group, Credit Unions Services Corporation (Australia) Ltd (CUSCAL) and Credit Union Financial Services (Australia) Ltd (CUFSAL). A second group, known as CREDITLINK, comprises Credit Union Treasury Services Ltd and Credit Union Settlement Services Ltd. CUSCAL and CREDITLINK are the principal SSPs to the industry.

Table 4-2 - State Supervisory Authorities

Name of SSA	*Acronym*
New South Wales Financial Institutions Commission	FINCOM
Queensland Office of Financial Supervision	QOFS
Registrar of Financial Institutions (ACT)	-
Registrar of Financial Institutions (NT)	-
South Australian Office of Financial Supervision	SAOFS
Tasmanian Office of Financial Supervision	TOFS
Victorian Financial Institutions Commission	VICFIC
Western Australian Financial Institutions Authority	WAFIA

Source: Stanford and Beale, 1995.

4.4.3 Mutuality

Societies, including building societies and credit unions, are now regulated directly by the FI Code rather than State legislation. This removes several of the interstate differences discussed above. Part 3 of the FI Code sets out principles, objects and characteristics of societies, although these principles do not have the force of law. In respect of credit

unions, the principles set out in the Code generally reflect those of the credit union movement, namely (s. 108(2) Part B):

- open and voluntary membership;
- democratic control;
- non-discrimination;
- service to members;
- distribution to members;
- building financial stability;
- on-going education;
- cooperation among cooperatives; and
- social responsibility.

Under the FI Code, a society is a "financial co-operative" (s. 109(1)). The objects of such a society are (s. 109(2)):

> (a) to raise funds by subscription, deposit or otherwise . . .
>
> (b) to apply the funds . . . in providing financial accommodation to its members;
>
> (c) to encourage savings among its members; and
>
> (d) to promote co-operative enterprise, and to provide programs and services to its members, to assist its members to meet their financial needs.

To enforce the traditional household sector lending of credit unions, additional controls are imposed. A credit union must ensure that at least 60% of the total assets of the credit union are financial accommodation to

its members (s. 113(2)). Not more than 10% of the total assets can comprise loans for commercial purposes (s. 113(3)). Carrying on any business using the names "credit union", "credit society" or "credit co-operative" is prohibited except for those organisations registered under the FI Code (s. 144(2). The name of a credit union must include the words "credit union", "credit society" or "credit cooperative" (AFIC Code s. 47B(2)).

More significantly, for a credit union, the rules must limit membership of the credit union "to persons having a common bond of association" (FI Code s. 115(5)(d)(i) and 131(2)). This membership requirement is reinforced on both sides of intermediation. A credit union can only accept deposits from members, and can only loan money to members within this common bond (s. 138). Consistent with the importance of pairwise identity between members of a credit union, shares cannot be transferred without permission (s. 153).

The FI Code deals with directors in a similar fashion to the pre-AFIC legislation, and adds further obligations in respect of conflicts of interest adapted from the *Corporations Law*. A director must be a member of the credit union (s. 238(b)). There is to be at most one employee director (s. 235) who cannot be chairperson of the board (s. 237(2)). Directors may not be paid, except with the approval of a general meeting (s. 244). In addition, a credit union (or a related body corporate) must not indemnify directors against liability (s. 244A). Directors, spouses, and associated entities may only borrow from the credit union if the terms are no more

favourable than one would reasonably be expected if dealing at arm's length and it is approved by two-thirds' majority of the board of directors (s. 243(2)). If the loan does not comply with these requirements, it can still be authorised by a general meeting, with full details made available with at least 21 days' notice (s. 243(3)). Credit union officers who are not directors may only borrow with the approval of a majority of the directors (s. 242). There is a prohibition on the entering into of contracts ("management contracts"), where the management of the credit union is vested in someone who is not an officer of the society, unless the permission of the relevant SSA is obtained (s. 245). Duties of honesty, care and diligence, and a duty not to make improper use of position or information are imposed in similar terms to the *Corporations Law* (s. 246).

Democratic governance principles are reasonably consistent with the pre-AFIC situation. The position in Queensland and NT, where each member must hold the same number of shares, does not apply since the FI Code provides for societies to be able to issue "withdrawable shares", but credit unions cannot issue "permanent" shares (s. 148). This means that for some credit unions, the concept of deposits and shares may coincide. The Code limits disproportionate influence by restricting the proportion of withdrawable shares controlled by any individual to 10% (s. 193(1)(d)). The 10% level is a stricter requirement than the pre-AFIC proportion of 20%, which applied in NSW, Victoria, WA and ACT. Voting rules are also slightly different. Although a stricter rule of one-

member-one-vote is applied to all credit unions (s. 253(1)), proxies are permitted if they are provided for in the organisation's rules. A person exercising proxies, however, may not act for more than 10 other members who have not specified the way in which their vote is to be exercised (s. 254). There is no limit to the number of proxies that can be exercised for members who have specified the way in which the vote is to be cast.

4.4.4 Prudential requirements

Under the FI Scheme, prudential rules are no longer contained within the legislation, but now are the subject of standards issued by AFIC. This rulemaking power is limited to a number of consultative procedures, reflecting the nature of the interstate agreement. Under the AFIC Code, the board must consult with the Commonwealth, SSAs, industry bodies, financial institutions, and other regulators, including: the Australian Securities and Investment Commission (ASIC); the Council of Financial Supervisors (COFS); the Insurance and Superannuation Commission (ISC); the Private Health Insurance Administration Council (PHIAC); and the Reserve Bank (s. 23). The statutory procedure involves at least 60 days' notice of the resolution to SSAs and publishing notices in newspapers inviting written suggestions on a proposed standard, and subsequently written comments on these suggestions. The AFIC board must consider all these suggestions and comments before making or amending a standard (s. 29).

The Financial Institutions Agreement, incorporating the initial standards

relating to prudential supervision and operational matters are annexed to the AFIC Code as its Schedule. The new arrangements are largely consistent with the Brady Committee's recommendation that direct controls over the operations of financial institutions be repealed. Loan-specific risks are no longer addressed by restrictions on the size of loans, such as 1% of assets or withdrawable funds. Instead, the concern of AFIC is to monitor large exposures in a similar manner to the Reserve Bank. Prior notification and reporting of exposures to individuals or associated persons above 10% of capital is required. The SSA may prohibit the credit union from taking on this exposure, or require a higher capital ratio to support the increased risk (Interstate Agreement Schedule [IAS] cl. 6). The concern about exposure is also reflected in the limit of more than 10% of the total assets for commercial lending (s. 113(3)). Gearing limitations and restrictions on borrowing from non-members are no longer applicable. The form in which surplus funds can be invested is no longer prescribed.

Liquidity requirements continue to be imposed, but modified to reflect reliance on the Reserve Bank's Prime Asset Requirement (PAR) mechanism. Liquid funds are to comprise 7% of all liabilities. The numerator for the ratio is based on the PAR numerator broadened to include bank deposits and bills, State or Territory Government issued or guaranteed securities, and deposits held with SSPs. CUFSAL acts as the national treasury for most Australian credit unions, investing statutory liquidity funds on behalf of individual institutions of over $2 billion. Credit unions are also required to set up comprehensive liquidity

management systems to monitor and manage operational liquidity and liquidity risk prudently, to the satisfaction of the relevant SSA. This approach is also based on the Reserve Bank liquidity supervision mechanism (IAS cl. 4). More generally, credit unions must implement risk management systems to control credit risk, liquidity risk and interest rate risk (IAS cl. 5).

Table 4-3 - Risk Weightings for Capital Adequacy Assessment

Assets	*Risk* (%)
Notes and coin, short term Commonwealth debts	0
Long term Commonwealth debt, State Government debt	10
Bank liabilities, local government liabilities	20
Residential mortgage loans	50
All other assets and claims (personal unsecured loans)	100

Source: Davis, 1994.

Requirements to accumulate reserves to a minimum level, by appropriations of surpluses, have been replaced by the adoption of a Capital Adequacy Requirement (CAR). Effectively, this adopts the Reserve Bank's risk-weighted capital adequacy mechanism, discussed above. Credit unions must maintain at least 8% capital of which 75% (i.e. 6% of capital) must be "core" or "Tier 1". These capital requirements might be increased if a credit union were to take on abnormal risks or failed to develop adequate risk management systems (IAS cl. 2). Table 4-3 presents the risk weightings applicable to credit union assets under the

AFIC Code.

Other prudential requirements in the AFIC standards include a formula for providing for doubtful debts for both secured and unsecured loans (IAS cl. 3), as well as general prohibitions against conducting financial intermediation through subsidiaries (IAS cl. 7), against making guarantees to third parties (IAS cl. 8) and against involvement with managed funds, such as superannuation (IAS cl. 11).

4.4.5 Solvency and supervision

AFIC can compel credit unions to provide liquidity support, on a proportional basis, to a credit union in an emergency (FI Code s. 42). Emergency lending of this kind is only compelled under restricted circumstances (s. 45), and AFIC is required to encourage SSPs to facilitate the provision of liquidity support (s. 46). AFIC also requires mandatory participation by all credit unions in a solvency support scheme (IAS cl. 17), replacing the range of State and industry based schemes in operation before the FI Scheme. This solvency support scheme is facilitated through SSPs and with the supervision of AFIC, under Part 3 of the AFIC Code (s. 47). CUFSAL manages 85% of funds for this scheme.

Under the FI Code, SSAs are also required to establish a Credit Unions Contingency Fund (ss. 97-105D). Credit unions are required by SSAs to deposit a proportion of their total liabilities in these Contingency Funds. These funds are intended (s. 97(2)):

- to provide protection for members of credit unions;

- to facilitate mergers and transfers of engagements between credit unions or between credit unions and building societies;
- to facilitate the rehabilitation of credit unions;
- to facilitate the liquidation of credit unions; and
- to facilitate the payment to and collection of levies.

Powers to supervise credit unions analogous to those of Registrars and Government solvency support boards are now vested in the relevant SSA under the FI Code. The SSA is vested with wide ranging powers of information gathering from financial institutions and SSPs, including taking evidence on oath or affirmation (ss. 75-76). Inspectors may be appointed with powers of entry, search and seizure supported by magisterial warrants (ss. 77-86). On application of a majority of directors, or 10% of its members, or of its own initiative, the SSA can call a special meeting of a credit union, or hold an inquiry into its affairs (s. 87). Where it is desirable to protect the public or otherwise in the public interest, the SSA can initiate special investigations under Part 10 of the FI Code, with functions and powers analogous to investigations carried out by ASIC. The SSA also has a special power of intervention. A credit union can be placed under direction if the SSA believes that (s. 88):

- the credit union has repeatedly contravened the financial institutions legislation;
- the credit union is trading unprofitably or has an accumulated deficit in its profit and loss appropriation account; or

- the affairs of a credit union are being conducted in an improper of financially unsound way.

The SSA is likewise empowered to suspend part or all of a credit union's operations (s. 89), to appoint an administrator (ss. 90-93), or wind it up (s. 340). AFIC has similar enforcement powers in respect of SSPs and supervision of industry funded solvency support arrangements (AFIC Code ss. 50-63).

4.5 Changes to pre-Scheme Regulation

Table 4-4 presents the major changes introduced by the FI Scheme in respect of the issues discussed in respect of mutuality, prudence, solvency and supervision. It is apparent that the FI Code has not only removed interstate differences in credit union governance structures, but also reinforced and expanded the legislative features consistent with the credit union as a mutual organisation. The legacy of cooperative statutes covering both credit unions and other organisations, as in Victoria, Tasmania and the ACT, has been overcome. Membership is now strictly based on a common bond of association. A credit union may only make loans to, and accept deposits from, its members. Directors must be members and the principle that they be unpaid voluntary officers is now applied consistently. In addition, the FI Code imports a range of duties, particularly in respect of conflicts of interest, from the *Corporations Law*.

Disproportionate influence through individual financial holdings in the credit union has been addressed by a limit of 10% of withdrawable shares,

Table 4-4 - The Financial Institutions Scheme

Pre-AFIC Issue	FI Scheme
Mutuality Loan restricted to members	FI Code s. 138 Deposits also restricted to members. Membership based strictly on common bond of association: FI Code s. 131(2).
Director must be member	FI Code s. 238(b)
Directors not to be paid	FI Code s. 244
No member to hold more than 20%	FI Code s. 192(1)(d) No more than 10% of withdrawable shares.
No proxies	FI Code s. 254 Limit of holding proxies for 10 other members if voting discretion involved.
One member one vote rule	FI Code s. 253(1)
Prudence Loans limited in size	No similar provision. AFIC concerned with avoidance of large exposures to individuals (>10% capital). (IAS cl. 6). A limit of commercial loans of 10% assets applies (FI Code s. 113(3)). At least 60% of credit union assets must be loans to members: FI Code s. 113(2).
Gearing	No similar provision.
Investment of surplus funds	No similar provision.
Liquidity	AFIC Standard Ratio of 7% liquid assets to liabilities, based on an expanded RBA PAR formula. Comprehensive liquidity management systems to be implemented (IAS cl. 4).
Reserves	AFIC Standard Ratio of 8% risk-assessed capital with 6% to comprise core capital. Risk weightings and capital definitions based on RBA CAR mechanism. Increased ratio for abnormal risks or inadequate risk management systems (IAS cl. 2).
Solvency support schemes	AFIC Code Part 6 AFIC Standard (IAS cl. 17) FI Code ss. 97-105D
Supervision	AFIC Code Part 8 FI Code ss. 75-93, s. 340 and Part 10

which is stricter than the figure of 20% in some pre-AFIC laws. Importantly, the one-member-one-vote principle is now entrenched without exception, although proxies are now permitted, which is more liberal than some pre-AFIC statutes.

Prudential requirements under AFIC largely reflect the application of the Reserve Bank style of supervision. Only two operational restrictions, on gearing and the investment of surplus funds, have no directly similar provision in the new supervisory arrangements. Loan specific risk is now addressed by notification of large exposures to individuals, and a limit of 10% in respect of commercial loans. The other loans requirement, that at least 60% of credit union assets must be in the form of financial accommodation to members, is designed to be a character reinforcing measure given the perceived importance of the credit union sector to household finance. Liquidity requirements are merely an extension of the Reserve Bank's PAR formula, coupled with new requirements for comprehensive liquidity and risk management systems similar to banks.

The major difference lies in the introduction of a capital adequacy requirement taken from the banking sector. Importantly, the required ratio is identical to banks at 8% of risk-weighted assets, although 75% of this must constitute core or "Tier 1" capital. Banks only need 50% (or 4% of risk-weighted assets) to constitute core capital. The risk weightings and capital definitions are taken from the Reserve Bank's CAR mechanism.

Little changed in respect of solvency support schemes and supervision, except that the role of supervisor, combining both pre-AFIC roles of the

Registrar and solvency fund board, was placed in the hands of SSAs.

4.6 Summary

It is apparent that the FI Scheme implements two policies, apart from the elimination of interstate differences in legislation, One is the reinforcement of the institutional character of the credit union in terms of membership and governance structures. The other, consistent with the general approach of both the Campbell and Brady inquiries, is the adoption of a functional approach to prudential regulation, with the object of competitive neutrality. At issue for this thesis is whether these two policies conflict. AFIC applies prudential requirements to both building societies and credit unions that reflect the approach of the Reserve Bank and international banking practice. The principal mechanism for prudential supervision is the minimum risk-weighted capital requirement. The following chapter questions competitive neutrality, and whether the imposition of a capital requirement is appropriate, given its underlying assumptions and incompatibilities with mutual organisational forms. It brings together the analysis of credit unions to draw conclusions as to the likely impact of the FI Scheme, particularly in respect of the integrity of the common bond of association.

Chapter Five
Impact of the Financial Institutions Scheme

The previous chapter discussed the legislative regulatory framework for credit unions, and the changes introduced by the FI Scheme. A significant aspect of the Scheme is the grouping of building societies and credit unions within the one legislative and supervisory structure. This chapter argues that a failure to appreciate the economic differences between these intermediaries explains conflicts between the FI Scheme regulations and the institutional form of credit unions, particularly in the imposition of a capital adequacy requirement.

Many aspects of the FI Scheme support the mutual nature of credit unions and the importance of the common bond to their comparative economic advantages, as discussed in Chapter Three. Principally, these aspects include:

- explicit adoption of cooperative principles drawn from the credit union movement in the FI Code (s. 108(2) Part B);
- endorsement of the credit union as a "financial cooperative", and the inclusion of objectives of promotion of cooperative enterprise, and services to members (s. 109(2));
- restriction on membership of credit unions to persons within

the common bond of association (s. 131(2));

- restriction on accepting deposits, and making loans, only to members within this common bond (s. 138);
- voting on the basis of one-member-one-vote (s. 253(1)); and
- non-payment of directors, except in limited cases (s. 244).

Directors' duties have been enhanced, particularly in respect of potential conflicts of interest, based on the *Corporations Law*. This is also appropriate since, as was discussed in section 3.3.3, there will be fewer constraints on management where the common bond is weaker, which can lead to self-interested behaviour unlikely to be corrected by the credit union membership.

A major area of concern, however, is the extension of Reserve Bank style prudential regulations to credit unions: in particular, the imposition of a risk-weighted capital adequacy requirement. The conflicts between this mechanism and credit union structure are discussed first. It is then argued that the introduction of the measure can be explained by a policy of competitive neutrality and a failure to appreciate the organisational differences between non-bank financial institutions. Finally, the predicted impacts of the FI Scheme are elaborated.

5.1 Capital Adequacy

The assessment of the impact of the FI Scheme begins with a discussion of the problems of the major element of prudential supervision, the capital adequacy requirement. Some inherent problems with the mechanism are

discussed, which are as relevant to banks and building societies as they are to credit unions. Two areas of particular concern in respect of applying capital adequacy to credit unions are canvassed. One is that the principal policy objective of capital adequacy - avoiding excessive risk-taking - is already addressed by the mutual organisation form, particularly in respect of the agency costs of debt. The other is that a capital adequacy requirement assumes an ability to raise equity funding, which is incompatible with an organisation with no permanent capital.

5.1.1 Inherent problems

Valentine (1991, p. 40) noted that the Campbell committee failed to consider unintended consequences of a capital adequacy requirement. Several inherent problems with the Reserve Bank's use of capital adequacy are identified in the literature. One issue is the reliance on historical cost accounting measurements. The distortions and potential biases from the use of historical cost accounting techniques can provide a misleading indication of a bank's capacity to absorb losses to protect depositors (Hogan and Sharpe, 1990). For example, the asset revaluation reserve arising from revaluation of bank premises counts as Tier 2 capital. A bonus share issue based on this revaluation converts this to Tier 1 capital. The capital adequacy requirement can thereby be subverted by the use of creative accounting. In 1988, for example, Westpac Banking Corporation revalued its headquarters from $20 million to $1.1 billion, permitting (together with a rights issue) an expansion in its lending

which increased group assets from $70.3 billion to $108.6 billion by 1990 (Sykes, 1994).

Another problem is that the risk-adjusted capital adequacy requirement bears little relation to market-related risks. In particular, the capital adequacy requirement distorts the allocation of credit, due to the unsophisticated risk weightings used by the Reserve Bank (Hogan, 1989). An effect of differential weighting is to encourage low risk category activities at the expense of those of higher risk, to segment financial markets, and to alter effective interest margins between alternative forms of financing, leading to significant market distortions (Hogan and Sharpe, 1990, p. 191; Kim and Santomero, 1988). The weights used by the Reserve Bank artificially favour lending against residential housing secured by mortgage, by implicitly assuming that all other forms of collateral are irrelevant for the risk assessment. This argument applies more forcefully to credit unions where the scope for capital raising is limited or absent.

Davis (1990a) notes that capital adequacy requirements would also have an impact on the effectiveness of monetary policy, although not to the same degree as the previous LGS/SRD and PAR mechanisms. The relationship with monetary policy derives from the capital requirement's effect on: interest rate setting practices; the relative size of the banking sector; constraints on bank expansion; relative costs for particular types of financing; and the nature of bank intermediation.

5.1.2 Assumption of risk-taking behaviour

Although a range of different justifications might be used for regulatory capital requirements (Berger, Herring and Szego, 1995), a common theme is the protection against excessive risk-taking (Ball and Stoll, 1998, p. 3).

Davis (1990b) discusses the potential impact of the Reserve Bank's risk-weighted capital adequacy requirements on Australian banks. He states that two arguments can be advanced for linking bank capital structure to riskiness of assets. One is that the capital structure of a bank may involve a risk of deposit default that is too high, particularly where contagion may create widespread undesirable social effects. Riskier assets imply higher chance of default and justify the additional capital to avoid or reduce depositor losses. A second argument is that the nature of the political environment means that banks are being provided with underpriced deposit insurance. Depositors believe that there is a government-backed guarantee against bank deposits, or that in the case of default, a government will not allow depositors to suffer. In both cases, the capital requirements address concerns of banks taking excessive risks to maximise the value to shareholders, an example of the agency costs of debt.

Minimum capital requirements reduce the possibility of runs on credit unions in an environment of no deposit insurance and, unlike banks, no implicit government guarantee of deposits. The impact of losses on member confidence may be diminished if they fall on communal rather

than private wealth (Davis, 1994, p. 37). According to the Campbell committee, "true capital" plays an "indispensable role in providing a margin of safety for depositors" (para. 19.189). On this basis, Campbell recommended that non-bank DTIs should be subject to appropriate capital ratios (para. 19.209). Given that interest rates will normally include a margin for risk of default based on experience, the capital requirement can only be of benefit if it is to cope with abnormal default situations. Davis (1994, p. 39), however, assesses the requirement of 8% for credit unions to be "grossly excessive".

Shrieves and Dahl (1992) believe that the primary concern for capital, from a public policy perspective, is based on the existence of incentives for excessive risk-taking by bankers. The lack of incentive to constrain risk in lending is a moral hazard problem (Hogan and Sharpe, 1990). Prudential regulation can be characterised as a response by government to the moral hazard problems stemming from the government's role as *de facto* insurer of deposits (Davis, 1997, p. 5). The incentives to increase risk can be conceptualised within an option pricing framework, in which maximising the value of shareholders' equity entails maximisation of the option value through increased leverage and asset risk (Merton, 1977; Black, Miller and Posner, 1978; Kareken and Wallace, 1978; Dothan and Williams, 1980; Marcus and Shaked, 1984; Diamond and Dybvig, 1986). This is an application of the agency problems of debt, discussed in Chapter Three. The existence of agency problems may explain the failure of the "textbook perspective" of increased efficiency from competition in the

financial sector following Campbell (Davis, 1995, pp. 45-46). Deregulation had reduced constraints on management behaviour, as well as the inherent "franchise" value of a bank licence and managerial tenure. Real profits expected over the long term through barriers to entry and stable market share were removed. These changes led to management incentives to increase risk-taking (Greenbaum and Thakor, 1995) that should have been matched by increased monitoring of management. Such monitoring, through improvement in corporate governance or market discipline, was lacking.

There is a conflict of objectives when capital adequacy requirements are imposed on credit unions. Prudential requirements are designed to reduce agency costs of debt, by reducing excessive risk-taking. Mutual organisations, as discussed in Chapter Three, are likely to have strong incentives for excessive *safety*, not only from the identity of depositors and members, but also due to agency relationships between members and management in the absence of market disciplining processes (Davis, 1995, p. 51). Prudential requirements based on assumptions of a clear distinction between members and managers are therefore questionable (Davis, 1994, p. 35). Credit unions do not have the same moral hazard problems as the corporate banks and should not be regulated as if they do (Hickson and McKillop, 1996, p. 136).

5.1.3 Assumption of equity raising

The minimum capital adequacy mechanism assumes an ability to raise

capital. As the Campbell committee notes (1981, para. 19.82, emphasis added):

> The effect of [a capital requirement] is to protect depositors by ensuring that any increase in a bank's holding of 'risky' assets beyond what is prudent, having regard to its existing capital base, is matched by an appropriate *increase in its capital*, i.e. is financed from equity rather than depositors' funds.

Commentaries on regulatory capital agree that the requirement is intended to ensure the appropriate raising of capital, through issue of equity shares, to address increased risks. Dahl and Shrieves (1990) find banks that are undercapitalised by regulatory standards are likely to issue equity. Ball and Stoll (1998, p. 4, emphasis added) state:

> If a firm is required to hold more equity by regulators, it simply *issues equity shares* at a fair price and invests the proceeds at a fair price.

In similar fashion, Perkins observed (1989, pp. 68-69, emphasis added):

> The principal aim of the new capital adequacy controls was to give banks an inducement *to raise* relatively larger amounts of capital if their business on the assets side was relatively [riskier].

While banks and building societies can raise equity capital from shares, credit unions operating in a mutual organisational form can only generate capital through increasing retained surpluses. In a study of capital management of Victorian building societies (both shareholder-owned and mutual) over the period 1970 to 1988, Sharpe (1991) concludes that mutual societies have little capacity to modify their capital in the short or medium term - a matter he believes should concern prudential regulators (p. 77).

The Campbell committee was aware of the special nature of the capital structure of credit unions and "co-operative" building societies. These institutions do not have any substantial conventional, non-withdrawable capital (para. 19.185). In particular, credit union members can receive their share capital back when they cease to be members and hence any capital contribution has no fixed nature (para. 19.187).

The Brady committee also noted that a supervisory system based on capital adequacy would be inconsistent with DTIs whose ownership and control systems are unsuited to the raising of capital. The solution, according to the committee, was to legislate to provide for all DTIs to adopt a capital structure based on the issue of permanent equity or "non-withdrawable" shares (1990, p. 90). This recommendation was not implemented in the FI Scheme. Only building societies are permitted to issue permanent share capital under the FI Code (s. 148(2)). This further highlights the inconsistency between a capital requirements and credit union organisational form.

A conflict is inherent between the prudential mandate to increase capital, and the cooperative objectives of the credit union. Increasing surplus implies maximising the trading gap, which is the opposite to the Taylor (1971) model of credit union behaviour discussed in Chapter Three. Increasing capital requires profiting from transactions with members, whereas increasing member welfare may involve lowering loan interest rates or increasing the provision of services to depositors as implicit interest (Davis, 1995).

Another effect of capital adequacy without a permanent capital source is that credit unions can only grow with a commensurate increase in capital. Rapid growth requires rapid increases in credit union surpluses, which might be inconsistent with pricing of loans to attract business. This disadvantage is not applicable to building societies and banks, which can raise capital from equity investment (Davis, 1994, p. 40). Such a difference may introduce a competitive bias towards shareholder-owned institutions.

5.2 Appreciation of Institutional Differences

The previous section demonstrated that a capital requirement was inconsistent with the mutual organisational form of the credit union, particularly in the misdirected policy of reducing risk-taking behaviour, and in assumptions of the ability to raise equity through issue of shares. This section provides an explanation for the adoption of the measure: that the policy goal of competitive neutrality between financial institutions limited the ability of policy makers to appreciate the important institutional differences between shareholder-owned and mutual institutions.

5.2.1 Competitive neutrality

The Brady Committee accepts and endorses one of the important themes of the Campbell Inquiry, namely the goal of competitive neutrality between financial institutions (Beale and Stanford, 1994, p. 5). The committee implicitly adopts a functional regulatory stance in making its

recommendations based on two groups of institutions; namely, those providing intermediation and those providing financial services. Both building societies and credit unions are merged into the same functional group by treating them as "deposit-taking intermediaries" (DTIs) (Brady Report, 1990, pp. 74-75). This approach treats building societies and credit unions as effectively the same for the purposes of regulation (1990, p. 83):

> Building and credit societies have much in common. Both raise funds from, and lend to, the household sector. Over time, there has been a general convergence of their balance sheet structures - a process that is likely to accelerate after deregulation . . . Existing institutional boundaries are more a result of historical accident than of natural market segmentation. In the Committee's view, there is no case for treating existing institutional groups differently from the perspective of supervision.

This competitive neutrality approach is also found in the imposition of the same capital requirements for all credit unions, regardless of size or common bond. Such an approach improperly assumes homogeneity among credit unions (Davis, 1994, p. 40). Hogan (1989, p. 65) notes:

> This perverse outcome can only be understood in terms of the fundamental objectives of uniform international capital adequacy requirements . . . soundness and stability in international banking, and competitive equality amongst international banks.

5.2.2 Concerns about credit unions

Competitive neutrality can be argued to be inappropriate on the basis that financial institutions differ in important respects, including different clientele, "cultures" and risk characteristics. Thompson (1990, pp. 4-5) of the Reserve Bank states:

> Building societies and credit unions are much closer to banks in the type of retail services they offer. But, again, they have sufficient differences - in ownership structures and business emphasis - to justify continued existence as distinct groups.

The Campbell committee believed that credit unions should escape the proposed prudential arrangements due to the special characteristics of mutuality and the common bond. Significantly, the Interim Report of the Campbell Committee notes the importance of the "common bond" in influencing a high rate of growth in the industry (Campbell Inquiry, 1980, para. 3.8). The common bond is seen in particular as helpful in the assessment of credit worthiness of borrowers and minimising bad debts (para. 5.102). This informational role for credit unions is consistent with the theoretical framework presented in Chapter Three.

The recommendation of the Campbell committee regarding application of prudential standards, including the need for a capital base, was limited to those credit unions "which borrow funds from the public" (1981, para. 19.190). By implication, credit unions for which mutuality through the common bond remains the important operating principle only borrow from their members and so fall outside these recommendations (Campbell Committee, 1981, para. 19.25):

> Institutions, such as smaller credit unions, that operate on the mutual principle in a meaningful sense and do not solicit 'public' funds would have to be specially treated for regulatory purposes.

In commenting on the proposed shift to a national statement of prudential standards, Uri Windt, the Deputy Registrar in NSW, states that

building societies and credit unions require different prudential standards, and in particular, "differing versions of capital adequacy" (Windt, 1990, p. 39). The State and Territory Registrars, in submissions to the Premiers' Conference, supported the adoption of the principles of the Reserve Bank capital adequacy approach, but only in respect of building societies (Conference of Registrars and Co-operatives, 1990, para. 5.4).

Even the Brady committee did not propose complete elimination of differences between building societies and credit unions. This was based on the institutions' own strongly held preference to retain their own identities, and the benefits from limiting potential contagion, in the event of a liquidity crisis (1990, p. 83). The committee also recommended an exception to the functional regulatory approach in respect of smaller institutions with a mutual structure and "traditional" approach to their operations. The Report recommended that prudential supervisors be granted power to exempt institutions with assets of less than $1 million from full compliance with the prudential guidelines (Brady Report, 1990, p. 94).

5.2.3 Perceived erosion of common bond

Given these concerns, a question arises as to why the outcome of the FI Scheme did not reflect these concerns. One explanation is that the recommendations of the Brady committee, and later discussions of the FI Scheme, were partly based on a perception that differences between these institutions and other financial intermediaries had been eroded. Unlike

the Campbell committee, the common bond was not seen as a significant factor affecting credit union behaviour (Brady Report, 1990, p. 28):

> The original self-help philosophy of credit unions provided for ownership of the society by its members and operation of the society for their benefit. Members originally had a common bond of association which encompassed occupational, industrial, religious or ethnic links. The recent tendency, however, has been for credit unions to outgrow the base associated with their common bond and to become community-based with few, if any, restrictions on eligibility for membership.

Such a sentiment is consistent with some observations of decay in traditional rationales for the resolution of collective agency problems in mutual organisations (Buckland and Thion, 1991). This perception might also be explained by the fact that the Brady inquiry was limited to Queensland. It was not a national investigation of financial institutions, despite the implementation of its major recommendations in the other jurisdictions. The perceived erosion of the importance of the common bond may have been influenced by local conditions. Credit unions were highly concentrated in Queensland, with the largest 8 credit unions holding 83% of total credit union assets, and the largest 12 holding 93% in 1990 (Brady Report, 1990, Table 2.7, p. 30). Given the relative size of these institutions, it is likely that few local credit unions were operating under the mutual principles "in a meaningful sense" as described by Campbell.

Until 1968, there was no separate credit union legislation in Queensland. The operations of credit unions were instead governed by the *Co-operative Societies Act* 1946-1962, which authorised credit unions to trade in goods, and to accept deposits from non-members (Stanford, 1969, p.

109). Such rules are at odds with traditional operational principles of credit unions, and may have undermined the importance of mutuality to institutions in Queensland. By contrast, in NSW credit unions have been dominant since the movement's inception (Runcie, 1969b, p. 225). Had the Brady inquiry examined NSW financial institutions, the committee might have reached different conclusions.

Evidence supporting this argument can be found in the record of opposition to the introduction of the FI Scheme in NSW, in the report of a select committee of the Parliament on that State's adoption of its template legislation (NSW Select Committee, 1992). The urgency of the Scheme's introduction meant that the Select Committee had a mere eleven days, from 8 to 11 May 1992, to prepare its report. The rush in implementing the FI Scheme, not only in NSW but in the other States and Territories, by the starting date of 1 July 1992 might also explain the lack of attention by policy makers to possible institutional differences and unintended consequences. Although the Select Committee recommended adoption of the Bill without amendment, it also believed the process of consultation between the AFIC Steering Committee and individual credit unions was unsatisfactory. It noted that smaller credit unions and building societies may suffer hardship from the Scheme, and recommended a later review of the legislation, if necessary. In receiving written submissions and evidence of witnesses, the Select Committee found little of concern on the part of building societies, but opinion was divided in the credit union movement. Representatives of peak bodies

such as AFCUL believed the consultative process to have been genuine and thorough. Some credit unions believed that they had insufficient opportunity to understand the full ramifications of the legislation, particularly given that the draft prudential standards had been released later than expected on 11 May 1992. Joining credit unions and building societies in the same legislation was seen as retrograde by some NSW credit unions.

5.3 Effects on Credit Unions

The following sections elaborate the predicted effects of the FI Scheme on credit unions. First are outlined the elements of the Scheme which, in contrast to international concerns, are not structural change issues for the Australian situation. These have been identified as unacceptably small institutions and the participation of non-user investor members. Both these potential challenges to credit union integrity have been addressed in the Scheme legislation.

Four specific areas of impact of the FI Scheme, and particularly the imposition of a capital requirement, are then examined. These effects are expected to include:

- increased emphasis on profitability to maintain minimum capital;
- changes to loan portfolio composition;
- accumulation of surpluses; and
- increased costs for smaller credit unions in respect of

management and compliance costs.

5.3.1 Concerns addressed by the Scheme

Cooperative institutional forms have developed in a slow process of evolution, through experience of success and failure of internal rules and practices. Recent concerns have been expressed in the cooperative and nonprofit literature that regulatory changes might threaten the integrity of mutual organisations. Two matters of international concern have, however, been satisfactorily addressed by the FI Code. One concern is the "generalized and indiscriminate acceptance" of cooperatives established with a very small number of members, as little as three or four, and the growth of "simplified cooperatives" which are authorised to concentrate their administration in a single person and operate outside regulatory supervision or audit requirements (Kaplan de Drimer, 1997). This might undermine the interactive dynamics of cooperatives; their ethical values, common purpose and association of efforts and resources of their members. In Australian, this factor is unlikely to be an issue. Although the pre-AFIC legislation in the ACT required a minimum of only 7 persons (s. 16(1)), and in Tasmania, 15 (s. 5(2)), the other jurisdictions required at least 25 or more persons over 18 years of age (NSW, s. 20; Qld, s. 7; SA, s. 11; WA, s. 18; NT, s. 24). The FI Code now insists on 25 as the minimum number of members for registration as a credit union (s. 114(4)). Failure to maintain this number can result in winding up (s. 341(1)(a)).

The other concern is the increase in participation of traditionally external persons or entities, which conflicts with the traditional view that members be associated by common socio-economic needs, be owners of the capital, in charge of the cooperative's administration and the main users of its services. In some of European countries, capital has been sought from non-user investor members; those who do not use the services of the cooperatives but merely wish to make profitable investments. This has resulted in changes to rules regarding capital, such as granting of voting rights proportionate to the level of investment (undermining the one-member-one-vote principle); authorising significant powers of administration or supervision (undermining solidarity and self-help); and special concessions in respect of surpluses and interest payments on contributed capital (contrary to the principle of benefits being distributed according to participation by use of services). In the context of the FI Code, the development is unlikely to occur in Australian credit unions. As discussed in Chapter Four, the one-member-one-vote rule (with limited proxy rights) has now been entrenched across all jurisdictions. Both the issue of "permanent" share capital, and the creation of management contracts are prohibited.

5.3.2 Profitability and growth

Prudential regulation is widely assumed to do the least harm to the efficiency of financial markets if there is minimum interference with operating decisions and framed so as to be flexible to allow the

intermediaries to adjust to changing circumstances (Campbell Inquiry, 1981, para. 18.30). Unless financial institutions are indifferent to their capital position, however, the imposition of a capital requirement will affect operational decisions (Davis, 1990a, p. 69). This creates an inconsistency between the prudential requirements and the stated objectives of reform within the financial sector (Greinke, 1998).

Beale and Stanford (1994, p. 17) argue that the inability of credit unions to raise equity capital will, in the context of the core capital requirement, restrict growth. Expansion is limited by the extent of retained earnings, which is likely to be restricted by increasing competitive pressure from banks. The formal relationship between credit union growth and the capital adequacy requirement is demonstrated by Davis (1994, pp. 41-42). If asset composition is assumed constant, then the required capital ratio (R) can be represented as:

$$R_t = \frac{NA_t}{TA_t}$$

where NA is net assets and TA is total assets. This can be rewritten as:

$$= \frac{NA_{t-1}(1+g_{NA})}{TA_{t-1}(1+g_{TA})}$$
$$= \frac{R_{t-1}(1+g_{NA})}{1+g_{TA}}$$

where g_{NA} is the growth rate of net assets, and g_{TA} is the growth rate of total assets. If the capital ratio is kept constant, i.e. $\frac{R_t}{R_{t-1}} = 1$, then $g_{NA} = g_{TA}$ or $ROI = g_{TA}$, where ROI is the return on investment. The capital

ratio will rise or fall where the return on investment is greater or lesser than the growth in total assets, respectively.

These relationships suggest a number of consequences for credit union financial management. Principally, credit unions must seek a particular target rate of return on investment to maintain capital adequacy, particularly when faced with growth opportunities. Davis (1994, p. 43) observes:

> One unfortunate consequence of the capital requirements, and an apparent objective of AFIC, is to focus the attention of credit union management upon achieving an "adequate" surplus each year, regardless of whether this is in the members' best interests or not.

An effective statutory mandate to increase or maintain profitability challenges the mutual objectives of the organisation. A profit objective can be regarded as essentially inconsistent with credit union aims. One of the major cooperative principles is return of surpluses to members through enhancement of services or better savings and borrowing rates. In Taylor's (1971) model, for example, the objective was minimisation of the interest rate differential subject to covering average costs. A profit objective implies maximising this margin subject to market conditions. This requires raising of loan interest rates, which might not be competitive, particularly in the housing loan area, or further increase the risk of loan default.

If manager's self-interest is ameliorated by the strength of the common bond, then the introduction of a requirement to achieve surpluses to

meet prudential requirements may erode the effectiveness of the common bond in addressing management behaviour. One issue confronting the industry is the education of credit union directors and managers in the methods and philosophy of the credit union movement. Lack of education has been cited as a major difficulty (Arneil, 1969). This problem is exacerbated if credit union managers are encouraged by regulators to seek profits and to achieve operational benchmarks based on commercial banking practices (Arneil, 1969, p. 38):

> In an economy such as ours, private enterprise continually holds up the rate of profit as a measure of success and we are conditioned to accept this criterion.

Increases in the size of surpluses can be seen as indicative of financial success and the competence of the manager, due to their close association with private sector profit performance.

Profitability of credit unions would be expected to rise as a consequence of the FI Scheme. AFIC (1993, p. 35) reports that credit unions had "worked hard to accumulate reserves" to meet the capital adequacy requirements, from a shortfall of over $85 million in 1990, when the scheme was announced, to $4.7 million in 1993.

5.3.3 Portfolio changes

Changing the loan portfolio is a rational response to capital requirements where the ability to raise equity funds is limited or absent. Where credit unions are able to emphasise mortgage lending and hold liquid assets, the capital requirement becomes less binding and growth opportunities less

restricted. AFIC annual reports reveal that residential mortgages increased from 15% to 54% of the average credit union portfolio from 1988 to 1998, principally at the expense of personal loans, which fell from 65% to 42%. This is a significant change in lending behaviour given the historical development of the credit union movement and past history of credit allocation. This change in portfolio mix may have an impact of the risk of the credit union itself. Personal loans have a shorter maturity than mortgages, so on average the industry would expect to see an increase in potential maturity mismatch between savings and borrowings. This can also affect the competitive position of the credit union relative to other financial institutions.

Given the informational advantages of financial mutuals discussed in section 3.2, the comparative advantage of credit unions would be expected to be found more in unsecured personal loans than in residential mortgages, where the real estate security suggests less of a need for costly screening and monitoring of borrowers. A significant shift to mortgage lending requires less reliance on the informational advantages of the common bond.

Changing the portfolio mix away from personal loans and towards mortgage lending brings credit unions into direct competition with other financial institutions. The home mortgage market in Australia is very competitive. The problem this poses for credit union integrity is that a substantial number of for-profit competitors might defeat some of the normative restraints embodied in the common bond. For example, the

minimum standards of service and conduct of profit maximising corporations may be taken as an acceptable benchmark for credit union performance (Hansmann, 1980, p. 876). Such a trend was suggested by a range of transaction fee impositions and increases by some credit unions in 1998, comparable to those charged by commercial banks (Blue, 1998). Pressures on credit union profits from competition in mortgage lending was cited as the reason for the fees. Beale and Stanford (1994, p. 16) note:

> Competition in the mortgage market between banks and non-banks has intensified as the now common capital adequacy requirements direct the attention of both sets of institutions to this profitable but capital preserving area of lending.

An internal conflict of incentives also occurs in terms of the "character" requirement of the FI Code. Credit unions must hold 60% of their assets in the form of "financial accommodation" to its members (s. 113(2)). On the other hand, the risk-weighting system makes liquid investments (which are not financial accommodation) attractive for its asset base. Given the common bond restriction, demographic characteristics can have significant effects on demand for loans and supply of deposits. These changes might be reflected in liquidity position, which in turn will have an impact on the capital ratio. Swings in liquidity would be inversely related to capital position, suggesting that increase in growth based on loan demand will be more difficult to adjust to than growth in deposits (Davis, 1994, pp. 43-44). This provides credit unions with an incentive to expand (and thereby weaken) the common bond of association, such as through mergers, in order to attract deposits and

manage liquidity.

5.3.4 Accumulation of surpluses

A consequence of the need to generate "adequate" surpluses and to meet capital requirements is the accumulation of significant surpluses within the credit union. While retained surpluses have value to mutual organisations, the fact that property rights in such surpluses are poorly defined may lead to challenges to the mutual institutional form.

Little has been written about the accumulation of surpluses and how or if these surpluses can be used. Tuckman and Chang (1993, pp. 259-260) speculate that surpluses increase the ability of the organisation to provide additional services or achieve a degree of independence from the preferences of funding sources, such as major donors (James, 1983). The surplus in these circumstances, particularly if derived from "commercial" operations, is effectively an earnings stream without external accountability. Accumulation of equity, particularly in liquid or semi-liquid assets, can finance emergent expenditures, reducing the vulnerability of the organization and increasing the job security of the managers.

A manager might increase the reserves of a mutual either to reduce the firm-specific risk of bankruptcy or to smooth the flow of perquisites, particularly if there are liquidity constraints (Rasmusen, 1988, p. 400). One concern is whether the goal of surplus accumulation is sufficiently rewarding in itself to be an incentive for nonprofit managers to behave as

a for-profit organisation in exploiting the information asymmetries with consumers or reduce the quality of services provided (Tuckman and Chang, 1993, pp. 261-262).

Proposed changes to rules regarding distribution of reserves that emphasise individual members' monetary interests in the cooperative over their common interests is increasingly of international concern to cooperative and mutual organisations. The traditional view is that reserves are indivisible, for the common benefit of members and as a foundation for future generations. Kaplan de Drimer (1997, p. 476) notes:

> Those structural changes ignore the danger, so often pointed out, that the revaluation and distribution of financial reserves would lead to the undue appropriation of those reserves accumulated thanks to the effort of previous generations, in favour of only some of the partners.

A particular danger with the accumulation of surpluses within mutual organisations is based on the lack of clarity in respect of ownership of this equity. The growth of accumulated reserves in mutual organisations provides incentives for controlling interests to seek to distribute parts of the communal wealth as private property, through conversion to a shareholder-based form where property rights over the surplus are clearly defined (Davis, 1994, p. 45). This is the "expropriation hypothesis" (Davis, 1997, p. 13), put forward as an explanation for the process of demutualisation in the financial sector. Kay (1991, p. 314) depicts this expropriation process as follows:

> [T]here is then a very large money-box, to which claims are ill-defined, and the temptation to open that money-box and share

> out the proceeds among current stakeholders is one which may be very strong . . . The breaking open of these money-boxes has been stimulated by the activities of professional locksmiths - merchant banks and other advisers - who see the prospect of substantial fees for themselves in enabling the custodians of the box to realize the value of the contents.

It is predicted that surplus accumulation will increase as a result of the FI Scheme. More generally, the regulatory system will generate pressures on credit unions to adopt an alternative institutional form[14] more consistent to the regulatory environment (Davis, 1994, p. 45).

5.3.5 Smaller credit unions

Finally, the FI Scheme increases the diversity and complexity of credit union legislation and regulatory requirements, which might conflict with the popular and democratic character of the organisation. Smaller credit unions in particular may also be adversely affected by substantial cost increases through supervision levies, the costs of meeting the new prudential standards, and additional reporting requirements.

If regulation is difficult to understand and apply, even to lawyers and economists, then the traditional administration of cooperatives by members themselves may be discouraged or eliminated. Processes of socialisation, education and training within cooperatives might be more difficult in a complex regulatory environment. Kaplan de Drimer (1997, p. 483) argues:

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[14] Davis (1994, p. 45) suggests attributing a share of the retained surplus to members'

> This could undermine their democratic control and lead to the bureaucratization of their administration, where powers are concentrated in the hands of a few executives while communication with member-users tends to weaken.

The protection inherent in regular and close examination of credit unions, coupled with advice in much of the pre-AFIC supervision can be seen as important where accounts are kept by individuals not always skilled in accountancy (Arneil, 1969, p. 35). If the approach of new regulators is to adopt more "hands-off" supervision and rely on submission of information, this may place additional pressure on credit unions to employ individuals with the appropriate expertise. Credit unions arose as small community based organisations with simple operations, suggesting an alignment of management and ownership interests due to use of managers with a shared relationship with members. This advantage is likely to be eroded by growth of the mutual to the point where the complexity of the operations dictates the engagement of expert managers not necessarily related to the institution's owners (Mayers and Smith, 1981; Masulis, 1987).

Importantly, despite the fact that small credit unions have significant informational advantages, Davis (1995, p. 51) notes a "concerted push to get rid of small credit unions" by regulators. Such a stance is also identified by the Campbell committee (1981, para. 18.24):

> . . . some State Registrars of Co-operative Societies have been

share accounts as a way to address the capital adequacy problem without sacrificing cooperative principles.

more interested in seeing mergers of existing institutions than encouraging new entrants.

Part of the difficulty with a capital requirement is the inability of small credit unions to achieve economies of scale without a merger (Davis, 1994, p. 40). Evidence of a supervisory stance in favour of mergers is the existence of the Credit Union Contingency Fund, which is partly intended to facilitate mergers and transfers of engagements between credit unions or between credit unions and building societies (s. 97(2)). There is also power vested in SSAs to direct a transfer of engagement (effectively force a merger) where certain conditions are met, under the FI Code (s. 296).

5.4 Implications

Although several elements of the FI Scheme support the common bond characteristics of credit unions, the extension of Reserve Bank style prudential regulation to credit unions is inconsistent with articulated policy objectives. Of particular concern is the imposition of a risk-weighted capital adequacy requirement. The introduction of this measure is based on a failure to appreciate important institutional differences, and risks eroding the strength of credit union common bonds and mutuality. Smaller credit unions may be particularly affected by administrative and compliance costs.

The analysis in this chapter leads to the following predictions about the effects of the FI Scheme on credit unions:

- a focus on profitability as a principal operating objective;

- constraints on growth through increased lending;
- a change in portfolio preference away from unsecured personal loans and towards residential mortgages;
- accumulation of retained surpluses;
- increased compliance costs for smaller credit unions;
- merger activity to address growth, liquidity, and compliance problems, and capital adequacy more generally.

Given the diversity of common bond types in the industry, the degree of impact is also expected to be different based on common bond types. The remainder of this thesis empirically tests a subset of the above hypotheses using financial data on credit unions in NSW.

Chapter Six
Empirical Literature Review

While few quantitative articles examine Australian credit unions, no study has yet been published on the effects of the FI Scheme on credit unions. This thesis therefore provides a valuable contribution to the literature. The purposes of this chapter are: to review the empirical literature in respect of credit unions; to introduce intervention analysis as a statistical method appropriate to assessing the impact of regulation; and to review the literature on regulatory interventions using this technique. Chapter Seven presents the data and methodology of the present empirical study, and discusses the results.

6.1 Studies of Credit Unions

A growing empirical literature studies credit unions, principally as a subset of microeconomics and financial economics disciplinary interests in financial institutions. This literature can be classified into three broad groups. The first deals with the behaviour of credit unions as an industry, its economic structure, and the influence of the regulatory environment. Another growing field searches for the existence of scale economies and diseconomies facing credit unions. The third group, of closer interest to this thesis, consist of studies of credit union organisational behaviour. Consistent with the argument of the previous chapters, the common

bond of association is a factor identified as significant in all these approaches is.

6.1.1 Industry Structure

Navratil (1981) develops and applies an aggregate model of the credit union industry in the United States. As discussed in section 3.3.1, this model is based on the assumption that an individual credit union is a price-taker. The objective function is cost minimisation subject to an exogenously determined level of output. Six simultaneous equations are used to estimate the loan market, investment in non-loan financial assets, and the credit union "share market" (supply of and demand for deposits). The model is estimated using two-stage least-squares regression of monthly data from January 1972 to December 1978.

The study finds evidence that credit unions do not always behave in an "economically rational" fashion. In particular, loans and other financial assets are not as substitutable as they would be in a profit-maximising intermediary. Non-loan assets appear to be a residue, smoothing flows in deposit and loan demand by members. Navratil summarises the results as follows (1981, p. 548):

> CUs appear to be quite loyal to their historical goal of providing members with low cost consumer credit, even if some potential revenues are sacrificed in the process.

Wolken and Navratil (1981) examine the effects of usury ceilings by comparing 707 federal and 769 state regulated credit unions for the years 1978 and 1979. Univariate testing of differences in means using analysis

of variance (ANOVA) demonstrates that federal usury ceilings are binding, with federal credit unions exhibiting significantly lower average loan rates. This result is supported by regression analysis of loan interest rates and growth rates, controlling for several supply and demand factors.

Barron, West and Hannan (1994) investigate the evolution of credit unions in New York City from 1914 to 1990. The study examines two alternative theories of organisational evolution. One is that old and large organisations increasingly dominate due to advantages over smaller rivals; the other that as organisations age they become less able to respond to new challenges, succumbing to more adaptive competitors. These are compared by relating the effects of age and size to organisational mortality and growth. Growth and mortality are modelled as functions of age, size, population density and environmental factors, using a maximum-likelihood estimator of a continuous-time stochastic process. The study controls for environmental effects using several indicators including inflation, and the economic climate both generally in the United States and locally within New York City. The results show that, controlling for size, the mortality rate of credit unions increases with age. This suggests that, at an early point in the life cycle of a credit union, adolescence is a liability; while at a greater age, risk of failure is due to senescence or obsolescence. Similarly, growth rates drop sharply after the first few years of an organisation's existence, consistent with senescence. The researchers hypothesise (p. 411) that the drop in growth rates at an early age for credit unions is consistent with the importance of the common

bond of membership. Given this limitation of potential membership, the rate of recruitment of new members is expected to decline over time.

Kaushik and Lopez (1994) examine the response of United States credit unions to the process of deregulation of financial intermediaries in the 1970s and early 1980s.[15] Descriptive financial data from 1980 to 1992, obtained from the official reports of the Credit Union National Association (CUNA), are analysed to explain industry trends. Relaxation of common bond requirements is found to have expanded potential membership of the industry and contributed to a trend of consolidation through merger. The number of credit unions was 13,379 in 1992, a decline of approximately 40% since 1980, yet total industry membership was almost 64.7 million in 1992, an increase of 48%. Federal deposit insurance is also believed to contribute to continuing industry growth. The trend of consolidation is reflected in a concentration of assets in the hands of larger credit unions. Institutions with assets below $2 million declined from 65% in 1980 to 38% in 1992. In terms of the common bond relationships, declining numbers of associational and occupational bonds principally represent the decline in credit union numbers, with associational common bonds declining in both absolute and relative terms over the study period. Residential bond credit unions experienced the greatest growth in average membership, with an annual average rate

15 Including the Federal Credit Union Act 1977; Financial Institutions Regulatory and Interest Rate Control Act 1978; Depository Institutions Deregulation and Monetary Control Act 1980; and the Garn-St Germain Act 1982, as well as deregulatory changes

of 8.96%.

Bundt and Keating (1988) analyse the effects of deregulation and enhanced competition on the costs and performance of credit unions in the United States, using a sample of the 100 largest institutions (measured by asset size) from 1979 to 1985. The model used is an expenditure version of a statistical cost accounting model applied to commercial banks (Hester and Zoellner, 1966; Nelson, 1985), which imposes assumptions of linear average cost curves and the absence of joint production. The model is used to test the null hypothesis that enhanced competition had no effect on credit union costs. The null is rejected at a 5% significance level in all years except 1983. In particular the costs of liability instruments are found to decrease on average, suggesting that deregulation (such as relaxation of the common bond requirement) favourably affects the cost of funds from membership, increasing the ability of credit unions to compete with other financial institutions.

6.1.2 Scale economies

There is an extensive empirical literature in respect of the existence of economies and diseconomies of scale facing financial institutions,[16] of

by the National Credit Union Administration. See Bundt and Keating (1988, p. 1333).

16 Studies include: Houston and Simon, 1970; Benston, 1972; Halpern and Mathewson, 1975; Colenutt, 1977; Geehan, 1977; Mullineaux, 1978; Benston *et al.*, 1982; Clark, 1984; Gilligan and Smirlock, 1984; Gilligan *et al.*, 1984; Nelson, 1985; Kilbride *et al.*, 1986; Berger *et al.*, 1987; Mester, 1987; Hardwick, 1989; Lawrence, 1989; Dowling and Philippatos, 1990; Noulas *et al.*, 1990; Gropper, 1991; Drake, 1992; Glass and McKillop, 1992; Altunbas and Molyneux, 1996; Clark, 1996; Mitchell and Onvural, 1996.

which credit unions constitute a small yet significant subset. This topic is of particular interest within Taylor's (1971) model of credit unions, on the basis that economies of scale will be mutually beneficial to both existing members and potential new members (Taylor, 1972). The other reason for interest in scale economies is that, although significant economies are consistently found in studies of other financial institutions, the evidence in respect of credit unions is conflicting. For example, in a study of credit unions in the United States over similar time periods, Koot (1978) discovers significant diseconomies of scale, while Wolken and Navratil (1980) find significant economies of scale using several measures of output. Kohers and Mullis (1988) measure cost efficiency using ratios of operating expenses to total assets and operating expenses to operating income. Cross-sectional data from United States credit unions in 1984 are sampled according to a matched-pair scheme, using six categories of size for testing for differences in sample means. The results confirm economies of scale, with smaller credit unions having significantly larger ratios in all category comparisons.

It appears that these results are partly dependent upon the definition of the production function, the statistical approach, and the time period chosen. Cross-sectional comparisons are difficult due to the existence of significant technological differences (Murray and White, 1980) as well as voluntarism and sponsoring employer subsidies (Fry *et al.*, 1982). A common specification of production is the Cobb-Douglas function under a cost minimisation constraint. For example, Crapp (1983) adopts a Cobb-

Douglas function to examine cost relationships of credit unions in New South Wales in 1979 and 1980. Using ordinary least-squares regression, the results reveal significant diseconomies of scale, although also finding significant cost advantages by credit unions with a greater involvement in technology. The finding of decreasing returns to scale is believed to be due to a bias introduced by the omission of organisational subsidies in the cost function (1983, p. 44). Murray and White (1980) also use a Cobb-Douglas function to examine cross-sectional data on 152 British Columbia credit unions for each of the years 1972-1975. They find significant economies of scale for credit unions using electronic business machine processing and those using computers. No economies of scale are detected for credit unions relying on manual accounting systems. Technology exerts a strong influence on both the position and slope of the estimated average cost curves for each of the three groups. The data also provide evidence of inefficiencies created by early adoption of more costly technologies.

Mullineaux (1978) and Murray and White (1983) adopt a translog cost function,[17] which is characterised by multiple outputs and avoids assumptions of homogeneity and constant elasticity of substitution in production. A translog specification facilitates estimation of the sensitivity of costs to increases in outputs, as well as cost savings by

[17] This is essentially a Taylor series expansion in output quantities and input prices, producing a more generalised form of the Cobb-Douglas function. The translog function is also quadratic in logs, whereas the Cobb-Douglas function is linear in logs.

production of several outputs jointly, that is, it allows estimation both of economies of scale, as well as scope. Murray and White (1983) use cross-sectional data for a sample of 61 credit unions in British Columbia for the 1976-1977 financial year, with the sample limited to organisations with similar levels of integration of information technology. Using ordinary least-squares regression in a system of simultaneous cost equations, the results show increasing returns to scale, as well as economies of scope between mortgage lending and other lending activities. Kim (1986) extends this system of cost equations and applies it to the same data set, to find overall economies of scale and product-specific economies of scale, but product-specific diseconomies of scale in respect of non-mortgage loans.

6.1.3 Organisational behaviour

There appear to be two approaches to studying the organisation behaviour of credit unions in the empirical literature. The first applies models of manager behaviour in the context of the industry and regulatory environment. The second measures the degree of conflict between borrower and saver interests in a credit union, through estimation of monetary benefits of membership.

Keating and Keating (1975b) examine the behaviour of credit unions in response to the regulatory environment, adopting the managerial discretion model of behaviour discussed in section 3.3.2. The manager strives to maximise personal utility rather than organisational goals such

as cost minimisation or profit maximisation. The model predicts that where the environment is more munificent, a manager is more likely to spend on emoluments and staffing. A sample of 299 credit unions in 1969 is analysed, measuring firm efficiency as the difference between the average cost of a credit union and a minimum average cost "frontier frame" based on the "best" firms in the sample. Environmental conditions are represented by proxies for local competition, factor prices, payroll deduction availability, and regulation. Costs are found to follow a U-shaped long run average cost curve, with economies and diseconomies of scale. Environmental factors have a significant and predicted effect on efficiency. The major finding of the study is that regulation is the most important of the environmental factors. The stringency of regulation was the most important determinant of credit union efficiency. Keating (1979) uses the same approach on this data set to assess the impact of potential efficiency-promoting factors. The effect of decreases in subsidies and competitive environments on the level of emoluments is assessed in a χ^2 test. The relationship with subsidies is significant at the 1% level, while the relationship with competition is significant at the 10% level. The same factors were related to the degree of organisational efficiency (relative to frontier frames) at 1% degree of significance.

The second stream of literature follows from Taylor's (1971) model of credit union behaviour, which identifies a potential conflict between borrower and saver interests in the allocation of membership benefits (as discussed in section 3.3.1). Studies find evidence of pro-saver bias in some

cases and pro-borrower bias in others. One approach adopts the measurement approach of Walker and Chandler (1977). Net monetary benefits are measured as the dividend and loan rates available from the credit union and the next best rates available to a credit union member. The distribution of benefits is measured as the ratio of net monetary benefits of saving by the net monetary benefits of borrowing. This ratio is equal to one if equally distributed, greater than one if biased to savers and less than one if biased to borrowers. Patin and McNiel (1991a) modify this model and apply it to 15,063 and 14,924 credit unions in the United States for the years 1984 and 1985, generating the null hypothesis that the mean of the differences between net monetary benefits of saving and net monetary benefits of borrowing is equal to zero across the industry. The null is rejected at 0.1% significance for each year, indicating a pro-saver bias at the industry level, although the actual size of the bias is less than 1% of the total industry assets. An examination of individual credit unions reveals a distribution of saver-, neutral and borrower-dominated behaviour across credit unions, with neutral behaviour the most common. Patin and McNiel (1991b) extend this analysis by examining the relationship between member orientation and the total benefits of membership. The same data set is used, but with the exclusion of credit unions considered inactive or insolvent, together with those with negative net benefits of saving or borrowing, reducing the sample to 9,660 credit unions. Total benefits are calculated as the sum of saving and borrowing benefits, and means are calculated for groups of credit unions

exhibiting each type of behaviour. The results show that credit unions that are highly borrower-oriented have the lowest level of total monetary benefits to members, while credit unions that are saver-oriented provide the greatest total member benefits. Neutral credit unions provide levels of member benefits greater than the borrower-oriented but less than the saver-oriented group. Different results emerge when the total benefits are scaled against particular base amounts. Neutral credit unions provide the lowest levels of net monetary benefits per member, per dollar of loans and shares (deposits), and per dollar of assets. Saver-oriented credit unions provide the greatest net monetary benefits per member, while borrower-oriented credit unions generate the greatest net monetary benefits per dollar of loans and shares, and per dollar of assets. The conclusion is that saver-oriented credit unions perform best in terms of maximising both total and per member benefits.

The argument that credit unions have variant objective functions which are saver or borrower biased is disputed by Smith (1986). He examines 951 United States credit unions over the period 1975 to 1979, to detect significant differences in behaviour in respect of loan and dividend rates. Separate regressions are run for each year against a set of institutional and geographic variables, and for the loan rate on a set of loan heterogeneity factors. The hypothesis of variant objectives is evaluated against a *t*-test of equality of coefficients as the null hypothesis. The calculated *t*-statistic is not statistically significant, nor are the signs of the coefficients consistent with the theory of borrower or saver bias. The failure to reject the null

hypothesis is maintained despite narrower and broader classifications of the different categories. The conclusion is that a neutral objective function is a reasonable description of credit union behaviour.

6.1.4 Common bond type

As discussed in section 3.3.2, the common bond of association is an important determinant of credit union behaviour and identification of comparative institutional advantage. The common bond has therefore been used as a variable when conducting empirical work in each of the three areas discussed above. For example, Kohers and Mullis (1988), in using a matched-pair technique to estimate scale economies, also pair credit unions by common bond of membership, as well as the principal activity of the sponsoring employer in cases of industrial membership (Kohers and Mullis, 1986). Brown and O'Connor (1995) use the common bond to divide Victorian credit unions into subsamples of asset size and bond type. The functional form implemented in that study is the translog cost function, which is used to calculate an average economy of scale measure for each subsample. To control for time period variations, cross-sectional analyses are conducted in each of 1983, 1986, 1990 and 1993. A total of 127, 108, 100 and 76 credit unions are used after data exclusions. Parish credit unions are entirely excluded from the sample and the remainder divided into "community" and "industrial" common bond categories. The results show that the null hypothesis of constant returns to scale cannot be rejected for community credit unions in all analyses

except 1990.[18] For industrial credit unions, the null hypothesis cannot be rejected in 1983 and 1993, although significant diseconomies of scale are detected in 1986 and 1990. Smaller credit unions display significant diseconomies of scale in 1983 and 1993, but the null is not rejected in the other years. The subsamples based on medium and large credit unions fail to reject the null hypothesis across all years. Using the total sample, diseconomies of scale are found to be significant at the 5% level.

Similarly, the common bond is used in studies of borrower-saver conflict. In examining net monetary benefits from credit union membership, Patin and McNiel (1991b) use common bond categories to test whether orientation or total monetary benefits is related to the type of bond. The common bond classification follows that used by the National Credit Union Administration, which divides credit unions into associational, occupational and residential groups. A comparison of mean values for each group finds that occupational credit unions have a significantly stronger saver-orientation than those with associational or residential common bonds, at the 0.1% level. Associational credit unions exhibit neutrality between borrowers and savers. Significant differences were also found in the total monetary benefits generated by credit unions with these different common bond types. Occupational credit unions ranked first, associational second and residential third.

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[18] In 1990, significant diseconomies of scale are found, which the authors believe to be a bias introduced by a one-off levy imposed in that year due to an insolvency (Brown

Importantly, there is evidence that the common bond is a significant determinant of organisational behaviour. Using data from a survey of 357 Australian credit unions, and 129 useable responses, Williams (1986) tests the hypothesis that the stronger the bonding between members, the stronger will be the bonding between members and management, and the greater the efficiency of the organisation. After filtering out credit unions with a parochial or ethnic membership base, the two categories of common bond remaining are industrial (organised around a common employer) and community (operating within a specific geographical location). The industrial credit union is seen as embodying a stronger common bond, since the relationship is an extension of the employment bond of its members. Community credit unions, particularly in urban areas, are expected to be more anonymous and to suffer loss of group cohesion. Credit union managers were asked to rate, on a scale from 1 to 10, their perception of the strength of the common bond of the cooperative's members. Industrial credit unions are found to have stronger common bonds as shown by a Mann-Whitney *U* test. Managerial salaries, controlled by asset size, are also related to the classification between the two types of common bonds, suggesting that the degree of bonding between members influences the degree of divergence between member and manager interests. Industrial credit unions also have significantly lower bad debts experience than community based

and O'Connor, 1995, p. 10).

organisations (Williams, 1986, p. 281).

Bundt, Chiesa and Keating (1989) examine whether the common bond relationship affects credit union behaviour, in respect of operating efficiency. Their study uses data from year-end balance sheets and income statements of United States credit unions from 1979 to 1985. Credit unions are divided into two groups, one representing "occupational" and "governmental" (civilian and military employees) common bonds, and the other representing "associational" bonds (religious organisations, labour unions, and similar types). Residential credit unions are excluded from the study. The largest 100 credit unions in terms of asset size are chosen from each group. Differences are expected to emerge between these two groups, with the occupational-governmental group predicted to have a comparative advantage in availability of payroll deductions, reduced interest collection costs, lower costs of information, greater subsidies from employers, and increased member convenience. The associational credit unions, typically smaller, are expected to have a comparative advantage in member cohesion due to "fraternalistic altruism" and a greater availability of volunteer labour (Bundt, Chiesa and Keating, 1989, p. 31). The expenditure version of the statistical cost accounting model used in Bundt and Keating (1988) is applied, using a pooled cross-sectional time series model to analyse the panel data from the year end balance sheets. A generalised least-squares estimation procedure is employed (Fuller and Battese, 1974). The study finds that the occupational-governmental group has a significant advantage in

processing of deposit accounts, presumably due to benefits from the employer in terms of data processing. This group also enjoys significantly greater economies of scale. Savers receive relatively lower average rates of return, and borrowers pay relatively higher rates of interest on loans, at associational credit unions. This result is contrary to expectations that associational credit unions are more exposed to competitive market forces. It implies that, in fact, the degree of bonding intensity is greater in the associational credit unions.

6.2 Intervention Analysis

When modelling some sets of data it is known that certain abnormal events will affect the variables under analysis. A method of modifying econometric models to account for these events uses "intervention"[19] variables. While such variables can be used to control for disturbances, the model may also focus on the intervention to test hypotheses about the impact of the intervention itself. This approach is referred to as "intervention analysis".[20]

6.2.1 Box-Tiao approach

Box and Tiao (1975) examine the question of modelling the impact of a regulatory intervention on time series data. Standard procedures such as

19 The term "intervention" was introduced by Glass (1972), in turn based on work by Box and Tiao (1965).

20 In pre-Box-Tiao studies this approach also described as an "interrupted time series quasi-experiment" (Campbell, 1963; Campbell and Stanley, 1966).

a Student's t test for differences in means would be invalid due to the likelihood of serial dependence, seasonality and nonstationarity in time series data. In general form, the time series model employed is:

$$y_t = f(\kappa, \xi, t) + N_t$$

where:

$y_t = F(Y_t)$ is an appropriate transformation of Y_t, the actual response;

$f(\kappa, \xi, t)$ can allow for deterministic effects of time (t) the effects of exogenous variables and interventions (ξ), with unknown parameters (κ); and

N_t represents stochastic background variation or noise, modelled as a general integrated mixed autoregressive moving average (ARIMA) process, using Box-Jenkins techniques (Box and Jenkins, 1970; Box *et al.*, 1994).

The intervention is represented by dummy variables. The two common forms of the variable used are pulses and steps. A pulse variable takes on the value 1 when the intervention occurs and 0 elsewhere. A step variable takes on the value 0 before the intervention and 1 thereafter.

Standard statistical analyses, such as trend analysis or comparison of mean observations during particular periods, will also detect the impact of an intervention event. The advantage of Box-Tiao modelling of an intervention event, however, is the capacity to identify changes in rates of increase and the nature of the intervention in terms of dynamic response

(Wichern and Jones, 1977). Transfer functions based on a step, pulse, or combination of these variables can be used to model dynamic responses to an intervention (Jenkins, 1979). For example, a first order dynamic response to an intervention could be represented by the following transfer function (Box and Tiao, 1975, p. 71):

$$Y_t = \left(\frac{\omega B}{1-\delta B}\right) S_t^{(T)}$$

where:

Y_t represents the additional effect of the intervention over the noise;

ω is the unknown magnitude of the intervention;

B is the backshift operator;

$S_t^{(T)}$ is the step form of the dummy variable;

t is time;

T is the time period of the intervention;

δ is the rate of decay of the intervention effect; $0 < \delta < 1$.

When $\delta \to 1$, the above transfer function collapses into a model of the form $Y_t = \left(\frac{\omega B}{1-B}\right) S_t^{(T)}$ in which the step dummy variable produces a "ramp" response of slope ω. Similar transfer functions can be applied to pulse intervention variables, or transfer functions can combine both pulse and step dynamics (McCleary and Hay, 1980).

6.2.2 Applications

To illustrate the technique, Box and Tiao (1975) apply intervention analysis to events intended to reduce the oxidant pollution level in Los Angeles. In 1960, traffic was diverted following the opening of the Golden State Freeway, and reactive hydrocarbon levels in locally sold gasoline were regulated by legislation. In 1966, regulations required engine design changes in new cars to reduce the exhaust of pollutants. The time series data consist of monthly averages of pollutant levels in Downtown Los Angeles from January 1955 to December 1972. The expectations are that the 1960 interventions would produce a step change in pollutants, while the 1966 intervention would generate a constant intervention change (a ramp effect), as new cars were sold. Due to the effect of the summer-winter atmospheric temperature inversion differential, the model form separates the post-1966 intervention variables into summer months and winter months. Significant monthly seasonality is also corrected in the final model. The fitted model provides evidence that the 1960 interventions create a step change of -1.09 units of pollutant, while the 1966 intervention triggers a yearly change of -0.025 units in the summer months and -0.07 units in the winter months.

Intervention analysis has been used in a range of contexts. Caporaso and Pelowski (1971) examine the effects of events on the degree of economic and political integration in Europe. Trend lines are fitted to the pre-test and post-test periods. Time series properties of the data are not modelled using ARIMA but by adjusting critical *t*-values by the degree of

autocorrelation. Lewis-Beck (1979) assesses the impact of the Cuban Revolution on economic production. Theoretical models of revolution all agree on a significant and immediate drop in economic production, followed by growth. Competing views of revolution, however, disagree as to the rate of economic growth in the longer term. These competing theories are analysed within a trend analysis using dummy variables for the revolutionary intervention, and comparing the pre- and post-revolution slopes for the fitted line. Contrary to the competing models, the regression demonstrated a short-term increase in energy production, followed by a negative change in slope. The study suggests that revolution might better be characterised as short-term benefits and long-run costs. Fomby and Hayes (1990) apply Box-Tiao intervention analysis to assess the impact of the "War on Poverty", a public policy initiative in the United States, on the income of families in the lowest quintile. Bonham and Gangnes (1996) examine the effect on hotel revenues of a room tax imposed by Hawaii. Lloyd, Morrissey and Reed (1998) estimate the effects of anti-dumping actions and cartelisation in the European Union on polypropylene prices and the level of imports from Japan. Detection of outliers within a time series is another application of intervention analysis (Shao, 1997, p. 184).[21]

[21] Examples include Abraham and Box, 1979; Hilmer, 1984; Tsay, 1986; Ledolter, 1988; Chen and Tiao, 1990; Chen and Liu, 1993, Tiao and Tsay, 1994.

6.2.3 Regulatory interventions

Intervention analysis is used for the empirical study of the impact of the FI Scheme reported in Chapter Seven. This reflects that an important area of application - indeed the "widest use" (McCleary and Hay, 1980, p. 141) - of intervention analysis is the assessment of the impact of regulatory changes.

Two "interrupted time series quasi-experiments" are reported into a 1955 crackdown on speeding in Connecticut (Campbell and Ross, 1968; Glass, 1968). The analysis uses annual data from 1951 to 1959. Graphical interpretation is consistent with an increasing fatality rate before the intervention and a decreasing rate afterwards, particularly in comparison to fatalities in other states. In statistical analysis, the intervention is assumed to have an immediate and constant effect (a step response) on the time series of fatalities, modelled as an integrated moving average process, and transformed for monthly seasonality. Although predating Box-Jenkins techniques, the method is based on an estimate for the shift created by the intervention suggested earlier by Box and Tiao (1965). This assumes an ARIMA (0,1,1) model of the following form:

$$Z_t = L + \delta + (1-\theta)\sum_{j=1}^{t-1} a_{t-j} + a_t$$

where:

Z is an observation at a point in time;

L is the true level of the series;

δ is the shift accompanying the intervention effect;

θ is the parameter for the moving average process; and

a represents the noise; and

t is represents either pre- or post-intervention observations, with the former model excluding the δ term.

Point estimates and t-statistics can be computed for both L and δ. The null hypothesis of no significant effect of the intervention is $H_0 : \delta = 0$. Data for Connecticut are compared with data from four control states (Massachusetts, New Jersey, New York and Rhode Island), to test the hypothesis that the shift in level of the Connecticut time series is less than the average shift in the other states. A statistically significant (p=6.5%) reduction in fatalities is detected.

Zimring (1975) examines the effect of the *Gun Control Act* 1968 on the rate of gun related violence in the United States, particularly the ban on importation of "Saturday Night Special" handguns. Visual interpretation of the trend of handgun homicides and firearm assaults for the 57 largest cities is that these crimes increase consistently through 1966 to 1963, but the rate of increase slows after 1969. This is consistent with a restricted supply of handguns. An inspection of trends for gun-related crimes as a percentage of all homicides and assaults shows a similar moderation from 1969. The impact of enforcement effort is estimated from "Operation

Disarm the Criminal", using monthly figures for gun and non-gun homicides in the District of Columbia from 1966 to 1971. Comparison of means for the pre- and post-intervention observations found a change in level for the gun homicides significant at the 10% level. A dynamic effect ("slow drop") is incorporated into the change in state by defining an intervention based on the effect being zero prior to the enactment, 1/6 in the first month, 2/6 in the second month, up to 6/6 (=1) from the sixth month and thereafter (Zimring, 1975, p. 190, fn. 200).

Deutsch and Alt (1977) use a Box and Tiao (1965) test to examine the effect of gun control laws on crimes in Boston, particularly a minimum one-year sentence for carrying a firearm without a licence. The deterrent effect of the gun law is evaluated by measuring the change in level of homicide, assault with a gun, and armed robbery, before and after its enactment. The data consist of monthly observations of these offences from January 1966 to October 1975. A significant decrease ($p=0.001$) in assaults of 18% is found after March 1975, and a 20% reduction in the monthly rate of armed robberies ($p=0.033$) after February 1975. Both responses are before the operative date of the law, consistent with early publicity. No statistically significant level process shift is detected in the homicide time series.

These results are disputed by Hay and McCleary (1979), using more parsimonious time series models and an extended set of post-intervention observations. In particular, they adopt a Box-Jenkins model-fitting procedure involving the examination of autocorrelation (ACF) and

partial autocorrelation (PACF) functions of the time series. Based on inspection of these functions and residuals of each model, the homicide time series is argued to be better modelled as ARIMA (1,0,0) than (0,1,1) as assumed by Deutsch and Alt (1977). The assaults time series is argued to be better represented in a model without seasonal differencing. The armed robberies series is also believed to be a model without seasonal differencing but also with a log transformation. Using the same characterisation of the effect of the intervention as a step variable, the intervention is significantly negative only for the assaults series. The Deutsch and Alt (1977) finding of a significant shift in the armed robberies series is not detected with the alternative model. The assaults time series also incorporates a temporary impact with a decay. Hay and McCleary find that the negative effect on assaults is not sustained, but erodes rapidly in the post-intervention months.[22].

Aaronson *et al.* (1978) examine the impact of decriminalisation of public drunkenness laws on the level of police handling of inebriates in Washington, D.C. and Minneapolis, testing the hypothesis that decriminalisation will be followed by a decline in police involvement. This would be contrary to legislative expectations that police would continue to serve as agents for the new model of detoxification and treatment rather than arrest and prosecution. Monthly rates of arrest for

[22] In rejoinder, Deutsch (1979) disputes the proposed alternative models, arguing that Hay and McCleary made errors in specification and in analysis of residuals, resulting in a "gross misidentification" (p. 318).

public drunkenness and police deliveries to detoxification facilities for the two test cities are used as well as two control cities (Houston and San Francisco). Statistically significant reductions in the level of police intakes are detected for the test cities (p=0.001) but not for the control cities. Using additional data, these reductions are evident even when controlling for the level of public intoxication and the rate of recidivism.

Bhattacharyya and Layton (1979) use a Box-Tiao model to assess the effectiveness of seat belt legislation on the road toll in Queensland. Three interventions are examined: compulsory installation of front belts in new vehicles from 1969, rear belts from 1971, and compulsory wearing of belts from 1972. Quarterly data on road deaths are collected for the period 1950 to 1976, restricted to deaths which were capable of being affected by the wearing of a seat belt. The original series demonstrates nonstationarity, trend and seasonality, which is partly corrected by seasonal differencing. Parsimonious accommodation of autocorrelation implies the following model for the pre-intervention series:

$$(1-B^4)Z_t = \theta_0 + (1+\theta_4 B^4)(1+\theta_3 B^3 + \theta_5 B^5)a_t$$

where:

Z are the observations;

B is the backshift operator;

$\theta_0, \theta_3, \theta_4, \theta_5$ are moving average parameters; and

a is a white noise process.

This model is found to be adequate for the years 1970 and 1971, but inadequate after 1972, based on the significance of the *Q*-statistic (Box and Tiao, 1976; Bhattacharyya and Anderson, 1976). This implies that the effective intervention is the compulsory wearing of seat belts in 1972, and not merely the fitting of seat belts to new cars. Given that older cars were not required to fit seat belts, and that cars with belts would be a growing proportion of the vehicle population, the intervention is modelled as a step change in the series, with a dynamic growth component:

$$(1-B^4)Z_t = \theta_0 + \frac{\omega_1(1-B^4)S_t}{1-\psi B} + \omega_2 S_t + (1+\theta_4 B^4)(1+\theta_3 B^4 + \theta_5 B^5)a_t$$

where:

S_t is the step dummy variable;

ω_1, ω_2 are the intervention parameters; and

ψ is an exponential decay parameter.[23]

Applied to the entire data set, ψ is found to have a positive fractional value, while ω_1, ω_2 have negative values. Only ω_2, however, is significantly different from zero. This suggests that the process of conversion of vehicles to seat belts is incomplete by the final observation of the time series used, as a stable negative trend is not sustainable in the longer term. A reduced model with only the step component $\omega_2 S_t$ is

[23] The model is analogous to the first order dynamic response transfer function noted by Box and Tiao (1975, p. 71), discussed above.

fitted to the data, with the intervention coefficient negative and statistically significant. The conclusion is that the compulsory wearing of seat belts did significantly reduce the road toll in Queensland.

Harvey and Durbin (1986) examine the effects of a 1983 law compelling the wearing of seat belts on British road casualties, using a structural time series model rather than an ARIMA approach. A structural model represents a time series as the sum of a trend, seasonal, cyclical, and irregular components, with complex models being fitted by the use of a Kalman (1960) filter. The structural model of the casualty time series incorporating an intervention is of the following form:

$$y_t = \mu_t + \gamma_t + \sum_{j=1}^{k} \delta_j x_{jt} + \lambda w_t + \varepsilon_t$$

where:

y are the observations, after appropriate transformation;

μ is a trend component;

γ is a seasonal component;

x are the j explanatory variables, with δ coefficients;

w is an intervention dummy variable, with λ coefficient; and

ε is a white noise process.

The data are monthly observations of numbers killed and seriously injured car drivers, front seat passengers, rear seat passengers, pedestrians

and cyclists from January 1969 to December 1984 in Great Britain, as well as seat belt wearing rates, indices of traffic densities and the real cost of petrol. Trend and seasonality components for the pre-intervention period are estimated, and additional explanatory variables, such as the car traffic index, and the real price of petrol, incorporated where significant. The intervention is treated as a step dummy variable, with a partial dummy ($w_t = 0.18$) in January 1983, for anticipation of the new laws. Amongst other statistically significant results for different types of road users, the model estimates a 23% reduction in drivers killed or seriously injured.

Deadman and Pyle (1993) use a Box-Tiao approach to examine the effect of the abolition of capital punishment, in November 1965, on homicides in Great Britain. The time series data are compiled from annual records of homicide in England and Wales from 1880 to 1989, and in Scotland from 1884 to 1987. An ARIMA model is constructed by inspection of ACF and PACF graphs, tentatively indicating an ARIMA (0,1,1) process for both the English-Welsh and Scottish data. A simple step dummy variable for intervention is found to be insignificant for England-Wales. A change of trend (ramp response) is instead adopted as the intervention process, as follows:

$$\Delta \text{hom} = \omega_t I_t + \varepsilon_t - \theta_1 \varepsilon_{t-1}$$

While the estimated change in trend is significant, the model without the intervention effect continues to provide a parsimonious representation of

the postintervention homicide series, although marginally underpredicting the homicide series. For the Scottish data, a step change rather than a trend change is more appropriate.

There is, however, only one study of credit unions that adopts (in part) an intervention approach. Barron, West and Hannan (1994), in their study of credit union growth and mortality, use a dummy variable to specify a period effect arising from the 1934 *Federal Credit Union Act*. This regulatory intervention enhanced the institutional standing of credit unions and increased founding rates for credit unions in the short term. Over the longer term, however, the federal legislation caused a decline in State-based registrations. The short term effect is captured by a dummy variable set at 0 for all years before 1934 and 1 for all later years. The declining registration trend is captured by defining the trend term of their model as the same dummy variable multiplied by a log-linear time trend set equal to 0 for all years before 1934 and equal to (year-1934) for all subsequent years.

6.3 Summary

This chapter provides a review of the empirical and methodological literature relevant to the empirical study to follow in Chapter Seven. In particular, the studies of credit unions can be grouped into three principal areas of interest: industry structure, scale economies, and organisational behaviour. In assessing the impact of the FI Scheme on individual credit union behaviour, the results provided by this thesis are most

appropriately classified as addressing organisational behaviour issues. The common bond is shown to be a significant component of analysis for all three areas. Intervention analysis, particularly in the Box-Tiao form, is introduced. Regulatory intervention literature using various intervention models is also reviewed. The intervention analysis technique is adopted in Chapter Seven as an effective statistical method for assessing the impact of regulation. The intervention analysis is supported by trend analysis and cross-sectional regressions to provide a basis for assessing whether impact of the FI Scheme is consistent with the predictions made in Chapter Five.

Chapter Seven
Empirical Analysis

The empirical study presented in this chapter tests some of the predictions made in Chapter Five as to the likely impact of the FI Scheme, principally in the introduction of a capital adequacy requirement. One prediction is that credit unions are more likely to focus on profitability as the principal operating objective, under pressure to maintain or increase capital, consequently accumulating retained surpluses. Another is that the Scheme would induce a change of portfolio preference towards residential mortgage loans, which carry a lower risk weighting. The former is assessed using intervention analysis the latter using trend analysis (due to data limitations), and these results in turn explained by a cross-sectional multiple regressions of factors drawn from the discussion in Chapter Five, including whether differential impacts are detectable between credit unions with different common bonds. The results suggest that the Scheme had an impact on credit union behaviour consistent with theoretical expectations.

7.1 Data and Aggregate Trends

7.1.1 NSW credit unions from 1987 to 1997

The empirical analysis is restricted to institutions in NSW, for three principal reasons. First, such a restriction avoids potential distortions

caused by interstate differences in pre-FI Scheme legislation. Second, a State other than Queensland is expected to provide a more effective evaluation of unintended consequences, on the assumption that the local conditions of the industry may have influenced some of the Brady Committee's assumptions (Chapter Five). Third, NSW contains the majority of Australian credit unions and therefore is expected to provide results that can be generalised to the other states and territories.

The data are compiled from statistical information records on credit unions maintained by the NSW Financial Institutions Commission (FINCOM) and the Australian Financial Institutions Commission (AFIC). These data are supplemented by hand-collected annual reports for the credit unions studied, particularly for the purposes of classification by common bond, identification of institutions with outdated FINCOM codes, and checking the data for errors before analysis. Quarterly financial data (income statements and balance sheets) for all NSW credit unions were obtained for the period June 1987 to September 1994 from FINCOM, and for all Australian credit unions from September 1992 to June 1997 from AFIC. These databases were spliced[24] and checked for errors both graphically and by random reconciliations with annual report information. The resulting database contains financial information for NSW credit unions from June 1987 to June 1997. Later financial periods are excluded, since the basis for collection of financial data by AFIC

[24] Using Microsoft Excel 98 Macintosh Edition.

changed in September 1997. From that quarter, a new Statistical Data System (SDS), developed internally by AFIC, was implemented (AFIC, 1998, p. 12). The years 1987 to 1997 are useful as pre- and post-intervention periods are of similar duration. From an initial set of 197 NSW credit unions operating in June 1987, exclusions were made of credit unions that merged or exited the industry, if the remaining time period was insufficient for the intervention analysis. This suggests a survivorship bias in the study that should be taken into account when interpreting the results. A total of 47 institutions were removed, leaving a sample of 150 credit unions for analysis (Table 7-1). In the Appendices, individual credit unions are identified by code rather than name, due to conditions on the use of data made available by FINCOM and AFIC.

Table 7-1:	Data Exclusions
Institutions in 1987	197
Excluded	47
Analysed	150

7.1.2 Classification by common bond

Credit unions are also classified according to common bond. Several approaches to classification appear in the literature, although the major groupings appear to be consistent, despite different labels. In the United States, for example, regulators classify institutions into "associational", "occupation" and "residential"; and a fourth category of "multiple groups" - an unknown composite of the other three categories (Kaushik

and Lopez, 1994, p. 236). Arneil (1969, pp. 21-22) divides Australian credit unions into three general types of common bond: "parish" credit unions, which embrace members of a particular church within the limitation of parish boundaries; "community" credit unions, which emerged from the growth of parish credit unions; and "industrial" credit unions.[25] In turn, industrial credit unions are divided into three sub-groups. One group represents credit unions within public service departments and instrumentalities, a second group from private industry, and the third type based within a trade union. Other credit unions are known as "associational". Crapp and Skully (1985, pp, 40-41) classify Australian credit unions into three broad varieties: "industrial", "community" (geographic area) and "sponsored" (trade unions, religious and ethnic groups).

Based on this literature the sample of credit unions is classified as follows:

- community bonds, based on geographic area;[26]
- industrial bonds, based on employment; and
- associational bonds, based on membership of a common

25 Brown and O'Connor (1995) adopt this classification in their study of scale economies in Victorian credit unions, discussed in Chapter Six.

26 A subdivision of community bonds into metropolitan communities (Sydney, Newcastle and Wollongong areas) and regional/rural communities was also undertaken. No statistically significant differences in behaviour emerged between these two groups after controlling for size and capital ratio influences.

association.[27]

A subdivision of industrial bonds into public and private sector institutions is made, consistent with Arneil. Classification is undertaken using information in the relevant credit union's annual report. The composition of the common bond categories is presented in Table 7-2.

Table 7-2: Common Bond Classification

Community	69
Industrial - public sector	51
Industrial - private sector	26
sub-Total Industrial	*77*
Associational[28]	4
Total Sample	150

7.1.3 Aggregate trends

Some trends, consistent with the predictions in Chapter Five, are evident in the data in aggregate, and in turn are supported by observations of AFIC contained in its annual reports. Figure 7-1 presents the total assets for NSW credit unions over the sample period. At the industry level, the data indicate maintenance of significant growth in assets. In 1995, for example, credit unions "posted strong performances over the year despite a slow down in economic activity" (AFIC, 1995, p. 27), and "solid asset

27 Analogous to the "sponsored" group identified by Crapp and Skully (1985).

28 The four associational bonds comprised one religious group, one primary producer association, and two ethnic community organisations.

Figure 7-1: Credit Union Assets - NSW 1987-1997

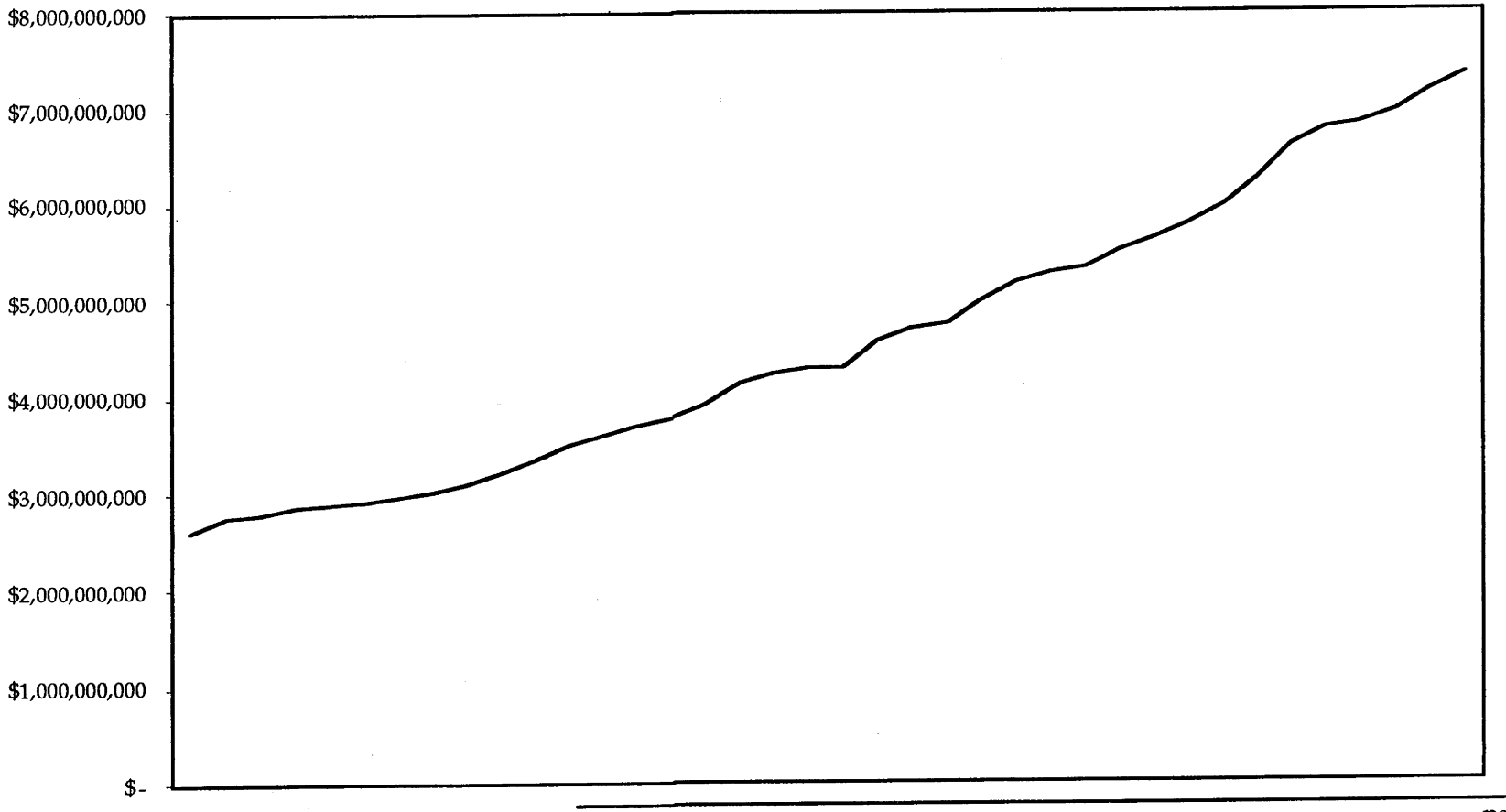
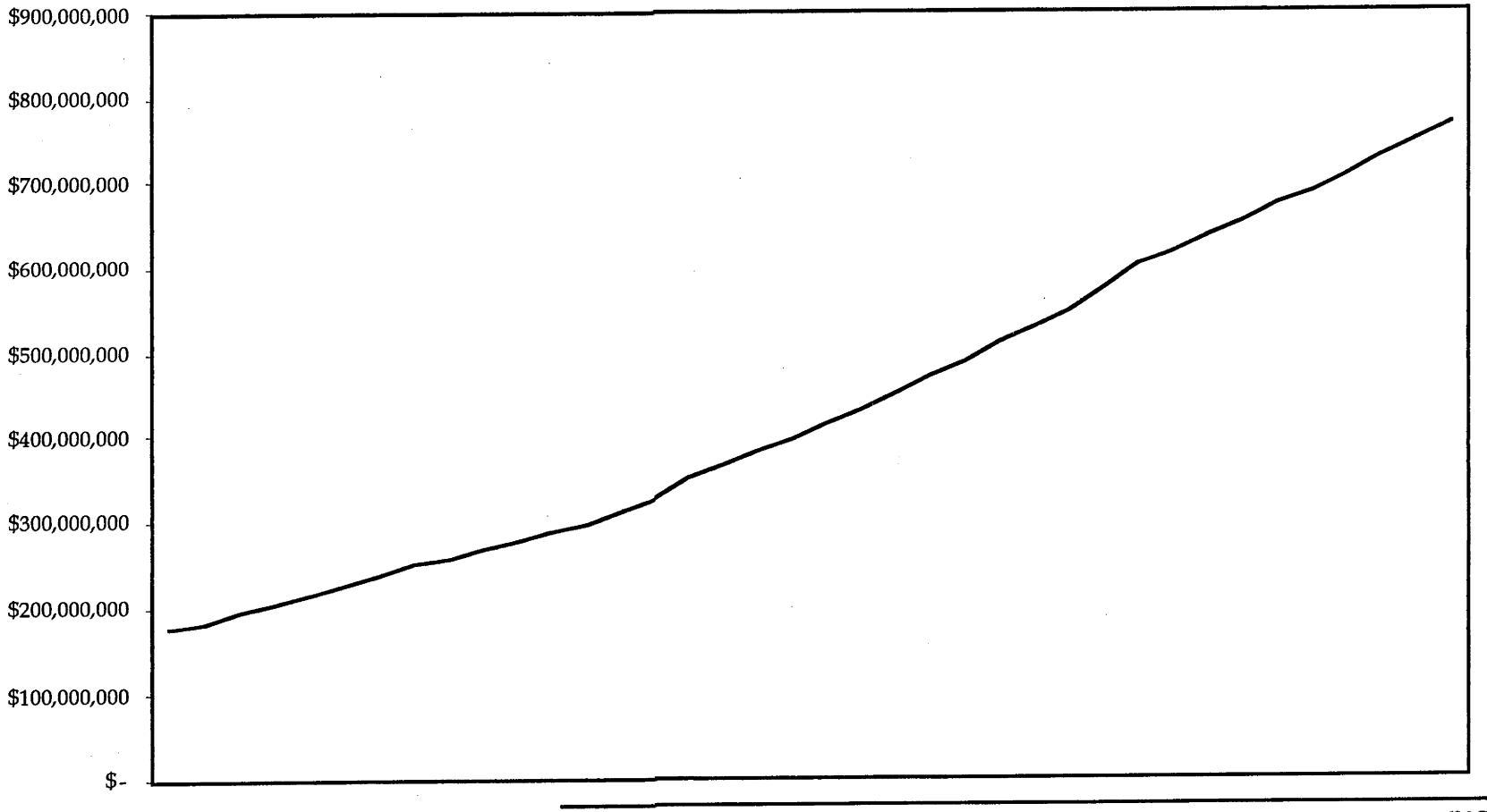


Figure 7-2: Credit Union Reserves - NSW 1987-1997



growth" in 1996 despite a slump in the housing sector (AFIC, 1996, p. 25).

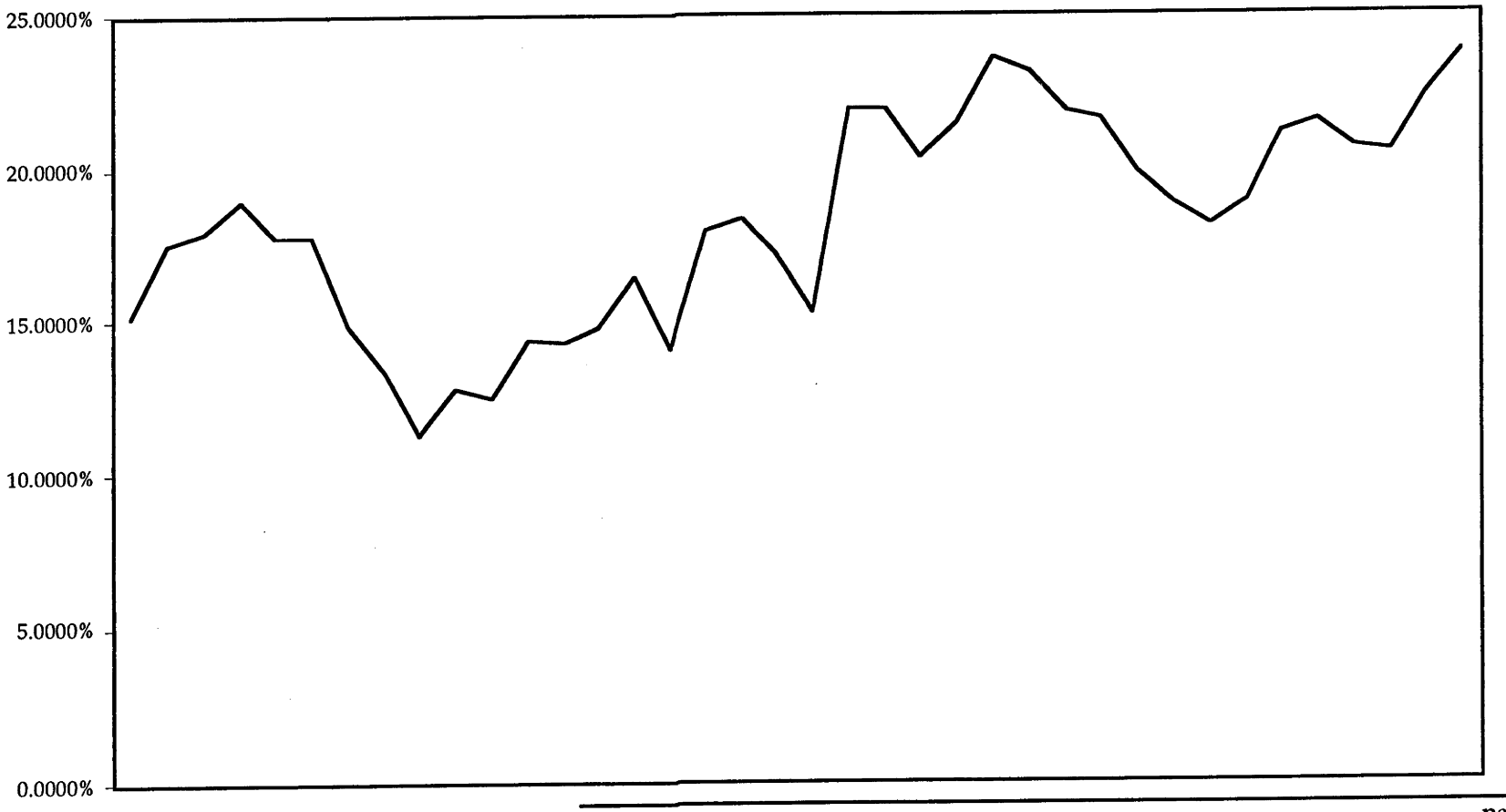
Accumulated reserves are presented in Figure 7-2, which indicates that capital has increased consistently with the growth in assets over the sample period. By 1996, reserves had grown at an average rate of 15% since the commencement of the FI Scheme (AFIC, 1996, p. 27). The rate of growth is funded entirely by greater reserves, increased, according to AFIC (1996, p. 29), despite "intense competition in the retail financial services sector". In 1997, AFIC (1997, p. 25) found:

> The high levels of capital through accumulated reserves . . . have supported growth over recent years.

More recently, however, intense competition for mortgage finance has eroded margins and limited profitability from lending. As a result, the introduction of fees and charges in the industry has been widespread, together with other non-interest income through cross-selling of insurance and personal finance products such as superannuation (AFIC, 1998, p. 26).

Aggregate liquidity is found in Figure 7-3. Liquidity levels were in excess of minimum requirements before the commencement of the FI Scheme, due to pre-AFIC prudential liquidity requirements (see Chapter Four). Liquidity is variable, swinging with changes in demographic characteristics and exacerbated by maturity problems in the credit union portfolio mix (Davis, 1994). The lower risk weighting of liquid assets also explains the upward shift in liquidity, visually apparent in Figure 7-3, on the introduction of the scheme.

Figure 7-3: Credit Union Liquidity - NSW 1987-1997



As predicted, the traditional form of lending by credit unions, personal loans, was overtaken by residential housing loans. This trend is evident in the lending portfolios since the scheme's commencement, contained in Figure 7-4. Nationally, housing loans reached 51% of the industry portfolio in 1996 and 54% in 1998 – from only 37% at the introduction of the FI Scheme. The change in portfolio mix contributed to slightly reduced loan yields after 1997 (AFIC, 1998, p. 26).

The credit union industry has "rationalised substantially" (AFIC, 1998, p. 24) since the introduction of the scheme, continuing a general trend of merger from the peak of over 700 institutions in the early 1980s. The number of credit unions registered each year is displayed in Figure 7-5. At a national level, there was a 29% reduction in the number of credit unions from 345 at the commencement of the Scheme to 245 by June 1998. The pattern is consistent with the expectation that mergers would in part address capital requirements under the FI Scheme. It also appears to be consistent with the experience in the United States following deregulation (Kaushik and Lopez, 1994).

7.2 Intervention Analysis

As discussed in sections 5.3.2 and 5.3.4, the capital adequacy requirement of the FI Scheme is expected to result in an increased emphasis on profitability as the principal operating requirement, to accumulate reserves for funding increases in lending. This prediction is assessed using intervention analysis.

Figure 7-4: Credit Union Loan Portfolio NSW 1992-1997

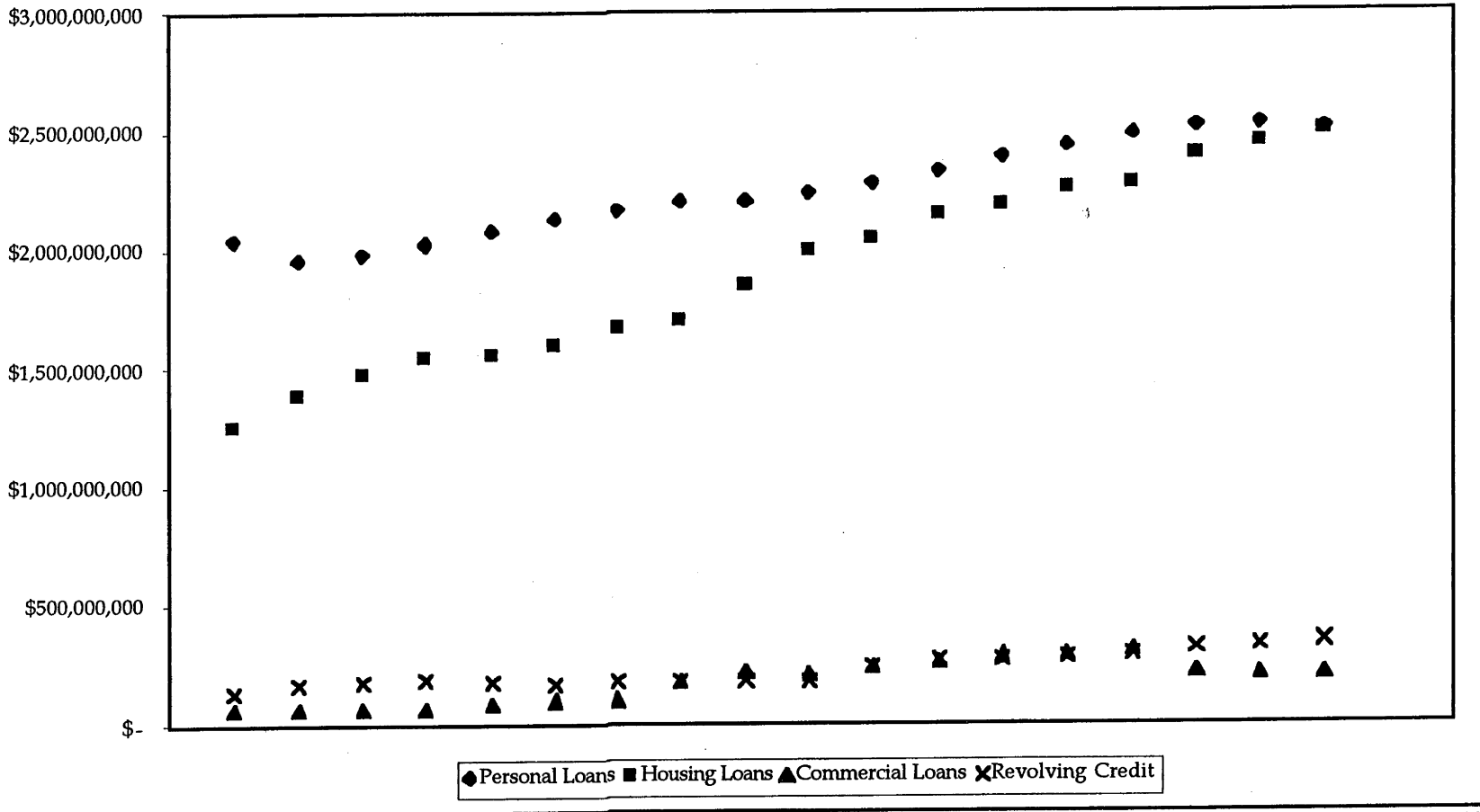
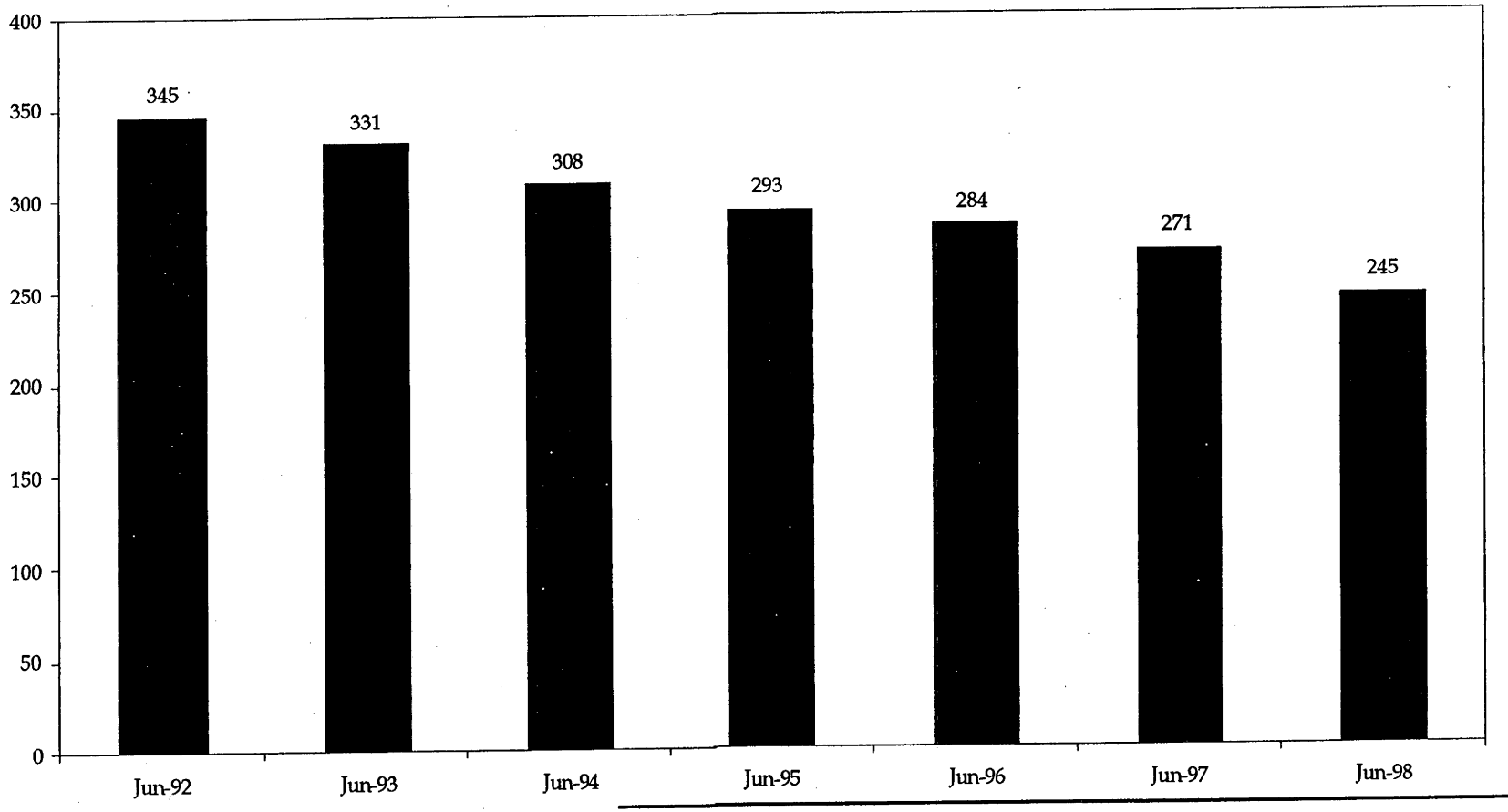


Figure 7-5: Number of Credit Unions (Nationally)



7.2.1 Method

Adopting a Box-Tiao approach, the model of the impact of the FI Scheme on the time series of accumulated reserves for each credit union is as follows:

$$ROA_t = \alpha_0 + \beta STEP_t + \sum_j \xi_j PULSE_{jt} + N_t$$

where:

$$ROA_t = \frac{(RESERVES_t - RESERVES_{t-1})}{ASSETS_{t-1}}$$

α_0 is the model constant

β is the coefficient of the intervention variable

$STEP_t$ is a step intervention dummy variable, which is either:

$$STEP91_t = 0 \forall t < 1991_{Qtr1}, 1 \forall t \geq 1991_{Qtr1}$$

or

$$STEP93_t = 0 \forall t < 1993_{Qtr1}, 1 \forall t \geq 1993_{Qtr1}$$

ξ_j is the coefficient of the j^{th} pulse variable

$PULSE_{jt}$ is the j^{th} pulse variable, which is computed as $PULSE_{jt} = 0 \forall t \neq T_j, 1 \forall t = T_j$, T being the relevant quarter in each case, and

N_t is a noise process, modelled as white noise or an autoregressive moving average (ARMA) process.

In this model, α_0 is the pre-FI Scheme *ROA*, while β is the increase resulting from the regulation. The null hypothesis of no significant regulatory impact is assessed as $H_0 : \beta = 0$. The form of the model is consistent with the intervention model discussed by Box and Tiao (1975). *ROA* (a proxy for return on assets) is a transformation of the time series of accumulated reserves (general reserves and retained profits) to induce stationarity and account for the size of the investment base from which profits are obtained. Even if profitability is constant, mere examination of a series of accumulated reserves would show increasing growth simply from a compounding effect due to an expanded asset base.

The intervention is represented by the step dummy variable, which is fitted either to *STEP91* or *STEP93*. Transfer functions for dynamic responses for the intervention are not used due to the short length of the time series. Use of two potential time periods to reflect the impact of the Scheme is based on the fact that the capital requirements were officially foreshadowed in April 1990, but legislatively implemented from July 1992. As noted in section 5.3.2, anecdotal evidence from AFIC suggests that some credit unions responded to this announcement by increasing reserves prior to the effective operational date for the scheme (AFIC, 1993, p. 35). The *PULSE* variables are not regulatory interventions, but variables to control for the effects of mergers or other outliers which affect the time series. Mergers are expected to induce a temporary upward spike in *ROA*. The incorporation of pulses in the analysis is presented in Table 7-3.

Table 7-3: Use of Pulses in Reserves Model	
No pulses	115
One pulse	30
Two pulses	4
Three pulses	1
Total Cases	150

The noise component of the model is estimated using a model-fitting procedure.[29] The noise identification process relies initially on inspection of plots of the autocorrelation function (ACF) - "correlogram" - and partial autocorrelation function (PACF), for both the pre-intervention series and the series as a whole. ACF(k) is the correlation coefficient between the time series and its k^{th} lag,[30] while PACF(k) is a measure of correlation between time series observations k units apart after the correlation at intermediate lags has been controlled or "partialed out". It cannot be directly computed, but is estimated by a solution of the Yule-Walker equation system (Box and Jenkins, 1976, p. 64; Durbin, 1960). The

29 The following strategy to model-fitting advocated by Box and Tiao is used (1975, pp. 70-71): "1. Frame a model for change which describes what is expected to occur given knowledge of the known intervention. 2. Work out the appropriate data analysis based on that model. 3. If diagnostic checks show no inadequacy in the model, make appropriate inferences; if serious deficiencies are uncovered, make appropriate model modification, repeat the analysis, etc."

30 Estimated as $$ACF(k) = \frac{\sum_{t=1}^{N-k}(Y_t - \bar{Y})(Y_{t+k} - \bar{Y})}{\sum_{t=1}^{N}(Y_t - \bar{Y})^2}\left(\frac{N}{N-k}\right)$$

model is estimated based on the initial identification, then diagnostic procedures are conducted, principally the estimation of ACF and PACF of the error series of the fitted model, together with computation of the relevant Box-Ljung Q statistic. The identification-estimation-diagnosis process is iterative until a satisfactory model is obtained for each of the 150 credit unions (Vandaele, 1983).[31]

7.2.2 Results

The results of each of the 150 intervention regressions and diagnostic statistics are reproduced in Appendix One. Table 7-4 shows the fitting of a noise process to each time series. Of the cases, 108 (72%) do not display autoregressive or moving average characteristics and are analysed using linear regression. It is likely that this is due to the short length of the time series involved, and a lack of resolution from using quarterly data.

Table 7-4: Noise Processes Fitted (Intervention Analysis)

AR(1) process	32
AR(2) process	5
Seasonal AR(1) process (quarterly)	5
Linear regression (white noise)	108
Cases analysed	150

The summarised results of the hypothesis testing are reproduced in Table

[31] The statistical processing and plotting of data is facilitated by SPSS 6.1 for Power Macintosh, incorporating SPSS Trends 6.1.

7-5. There is evidence consistent with the argument that the FI Scheme had an impact on credit union reserve accumulation, in terms of a significant change in the *ROA* time series following introduction of the Scheme. For 65 credit unions (43%) the null hypothesis of no regulatory impact is rejected at a significance level of 10% or less, with 23 institutions (15%) rejecting the null at 1% significance. The more interesting result is that for 43 (66%) of the significant cases, the coefficient (β) is *negative*. This finding is consistent with AFIC's observation that the overall profitability of credit unions has decreased since the commencement of the FI Scheme (AFIC, 1998, p. 28).

Table 7-5: Results of Intervention Regressions[32]

β	1%	5%	10%	>10%	Total
Positive	9	4	9	50	22/72
Negative	14	15	14	35	43/78
Total	23	19	23	85	65/150

The intervention regressions provide mixed results in terms of the *ex ante* expectation of increased emphasis on profitability to meet capital requirements. A majority of the cases show no significant regulatory impact, and many of the significant cases show a negative impact. There are two explanations for these results. One is based on the relationship between capital and growth under the capital adequacy requirement noted

32 The significance levels are represented as exclusive categories; e.g. 5% refers to the number of cases in which $0.01<p\leq0.05$. The same applies to Table 7-8.

by Davis (1994) and discussed in section 5.3.2. The dependent variable, *ROA*, is scaled by total assets. Therefore, a fall in *ROA* might not indicate reduced emphasis on profitability, but instead represent a pattern of growth in assets through increased lending which outstripped growth in capital through increased reserves. The other explanation is that changes to profitability and portfolio mix are substitutes in terms of addressing capital adequacy requirements. The latter argument is supported by the results of the trend analysis in the following section, and the cross-sectional regressions in section 7.4.

7.3 Trend Analysis

Changing the loan portfolio is argued (in section 5.3.3) to be a rational response to a risk-weighted capital requirement. The prediction is that credit unions will increase the proportion of housing loans, which carry a weighting of 50%, to address the new regulatory requirements. The results reported in this section confirm this hypothesis.

7.3.1 Method

An intervention analysis could not be conducted in respect of the portfolio behaviour of credit unions, since a decomposition of loans by category is unavailable until after the commencement of the Scheme. A post-intervention trend analysis is used instead, but using a similar model to the intervention analysis, based on the general form of the Box-Tiao model. This incorporates an explicit time variable, but omits the step intervention dummy:

$$\%HOU_t = \alpha_1 + \gamma t + \sum_j \xi_j PULSE_{jt} + N_t$$

where:

$\%HOU_t$ is housing loans as a percentage of total loans

α_1 is the model constant

γ is the coefficient of the time variable

ξ_j is the coefficient of the j^{th} pulse variable

$PULSE_{jt}$ is the j^{th} pulse variable, $PULSE_{jt} = 0 \forall t \neq T_j, 1 \forall t = T_j$, T being the relevant quarter in each case, and

N_t is the noise process.

The null hypothesis of unchanged portfolio preference is evaluated as $H_0 : \gamma = 0$. The constant term (α_1) is irrelevant as its difference from zero and statistical significance depend entirely on the way in which t is modelled.[33] The proxy CLOCK, which is computed as: $CLOCK_t = 4FYEAR_t + QTR_t - 7951$ represents time (t). This produces a variable that increments by one every quarter, commencing at $CLOCK$=1 at the 4th quarter of the 1987 financial year. As in the intervention analysis, pulse dummies are used to control for merger effects, but these are not appropriate where the merger or outlier event does not occur after the 1st quarter of 1993. The assessment of the noise process is identical to

[33] Coefficients and significance levels for α_1 are, however, reported for completeness in Appendix Two.

the procedure used in the intervention study, with no assumption that the processes for an individual credit union will necessarily be identical.

Table 7-6: Exclusions for Trend Analysis	
Initial cases (June 1987)	197
Incomplete series exclusions	47
No housing loans exclusions	41
Cases analysed	109

The number of cases analysed is further limited by the observation that some credit unions do not engage in home loan lending. These institutions (41) are excluded from the trend analysis, as in Table 7-6.

7.3.2 Results

The results of each of the 109 intervention regressions and diagnostic statistics are reproduced in Appendix Two. Table 7-7 shows the fitting of a noise process to each time series. A first-order autoregressive process is detected in 88 cases (81%), with the remainder white noise, prompting the use of linear regression.

Table 7-7: Noise Processes Fitted (Trend Analysis)	
AR(1) process	88
Linear regression (white noise)	21
Cases analysed	109

A summary of the results of the hypothesis testing are found in Table 7-8. The evidence of a changed portfolio preferences following introduction of

the FI Scheme is considerable, with 94 cases (86%) rejecting the null hypothesis at a significance level p≤10%, and 61 (56%) at a significance level of p≤1%. Moreover, the sign of the γ coefficient also supports the predicted increase in proportion of housing loans, with 80 (85%) of the significant coefficients positive. This includes 51 (84%) of the coefficients significant at the 1% level.

Table 7-8: Results of Trend Regressions

γ	1%	5%	10%	>10%	Total
Positive	51	16	13	7	80/87
Negative	10	3	1	8	14/22
Total	61	19	14	15	94/109

The strongly positive response across the sample supports the proposition that a change in portfolio and increased profitability are substitutable strategies for dealing with the imposition of a capital requirement. Indeed, given the lower margins and more competitive market for residential mortgages, the generally negative or null responses in terms of *ROA* found in the intervention analysis should be expected if many credit unions have instead increased the proportion of housing loans in their portfolios.

7.4 Cross-Sectional Analysis

To better understand the nature of the responses by the sample of credit unions to the regulatory intervention, the results from each of the intervention and trend analyses are explained by cross-sectional multiple

linear regression. This permits hypotheses as to the nature of the responses to be tested. It is argued that the individual responses can be explained by four principal factors. First, as discussed above, the two strategies predicted in Chapter Five (increasing profitability or increasing the proportion of housing loans) are likely to be substitutes. If the portfolio mix changes to emphasise lending for residential mortgages, the smaller margins and more competitive market are likely to lead to a decrease in *ROA*. Second, different behaviour should be detectable across different common bond types, as a proxy for strength of member trust and cohesion, screening and selection processes, and informational advantages in the credit market. Third, size should also influence the nature of the response to the introduction of the Scheme, on the basis that size is also a proxy for member bonding. The usefulness of the common bond is likely to deteriorate as the credit union becomes relatively large and impersonal (Gambs, 1981). Fourth, the level of capital existing at introduction of the Scheme will influence the response. Changes in behaviour as a result of the Scheme are more likely where the credit union is facing difficulties in meeting the regulatory requirements.

7.4.1 Explaining Beta

To explain the results of the intervention analysis, a cross-sectional equation is developed with a transformation of β as the dependent variable. The regression model (in general form) used is:

$$BETA = \alpha_3 + \lambda_1 GAMMA + \lambda_2 LOGCAR + \lambda_3 LOGASS + \sum_j \lambda_{3+j} BOND_j + \varepsilon$$

where:

BETA is a transformation of the results of the intervention analysis, computed as:

$$BETA = -1 \forall \beta < 0 \wedge \mathrm{p}(t) \leq 10\%, 1 \forall \beta > 0 \wedge \mathrm{p}(t) \leq 10\%, 0 \forall \mathrm{p}(t) > 10\%$$

α_3 is the model constant

$\lambda_{1\ldots3+j}$ are the model coefficients

GAMMA is a transformation of the results of the trend analysis, computed as:

$$GAMMA = 1 \forall \gamma > 0 \wedge \mathrm{p}(t) \leq 10\%, 0 \forall \gamma < 0 \vee \mathrm{p}(t) > 10\%$$

LOGCAR is the natural log transformation of the capital adequacy ratio of each credit union at the commencement of the scheme

LOGASS is the natural log transformation of the total assets of each credit union

$BOND_j$ is the j^{th} dummy variable representing a particular common bond classification, and

ε is the error term.

The transformations of *BETA* and *GAMMA* are made to avoid the influences of variance within coefficients where p>10%. All these coefficients are assumed to be zero, as are cases excluded from the trend

analysis on the basis that no housing loans were extended. These institutions are all treated as non-responsive on the question of portfolio mix, with *GAMMA* set to zero. Natural log transformations of size (*LOGASS*) and capital ratios (*LOGCAR*) are made to avoid problems of non-normality in the variables, due to kurtosis. In modelling the common bond variables, *BOND* is represented by each of the dummy classifications presented in Table 7-2. The final equation is based on a model-fitting process, aimed at parsimonious representation of the significant factors influencing each of the earlier results, assisted by diagnostic assessment of the fitted model and its residuals.

The regression model finally estimated, and presented in Table 7-9 is:

$$BETA = -1.364830 - 0.288111GAMMA - 0.263240LOGCAR + 0.052461LOGASS + 0.131074INDPUB$$

F = 4.32818 Significance of F = 0.0025

Table 7-9: Variables in Beta Equation

Variable	λ	SE	t	p(t)
Constant	-1.278664	0.422842	-3.024	0.0030
GAMMA	-0.272489	0.097252	-2.802	0.0058
LOGCAR	-0.255808	0.106686	-2.398	0.0178
LOGASS	0.049256	0.026828	1.836	0.0684
INDPUB	0.110359	0.092288	1.196	0.2337

Some inferences can be drawn from these results. First, the results for *BETA* (intervention to *ROA*) and *GAMMA* (trend of *%HOU*) are inversely related. This confirms the hypothesis proposed earlier that

changing portfolio mix and increasing profitability are substitutes. Second, the negative coefficient for *LOGCAR* implies that a systematic increase in *ROA* is more likely where the capital levels of the institution are lower. This result agrees with the proposition that the impact of the capital requirement will be greater where the institution is closer to infringing the regulation. Third, the influence of the common bond of association is apparent, but its statistical significance is weaker. After controlling for the effects of size through *LOGASS*, only *INDPUB* (industrial, public sector bonds) had any influence on the model approaching reasonable statistical significance. The positive coefficient for *LOGASS* confirms the hypothesis that larger institutions will have less effective common bonds. Consistent with stronger membership bonding and cooperative principles, smaller institutions are less likely to increase profitability as a result of the FI Scheme. That *INDPUB* is also positive agrees with the observation of Arneil (1969, p. 22) that public service credit unions, in contrast to the private sector, "do no usually attain the ideal of service usually rendered by other credit unions", suggesting a less effective common bond. This finding is, however, tentative given that its p-value is only 23.37%. That the remaining common bond classifications do not approach significance suggests that, for this sample, size may be a better proxy for member bonding than the classifications used in the literature.

7.4.2 Explaining Gamma

Using the same computation process for the relevant variables, the cross-sectional regression model used to explain the results of the trend analysis (transformed γ as dependent variable) is:

$$GAMMA = \alpha_4 + \varphi_1 BETA + \varphi_2 LOGCAR + \varphi_3 LOGASS + \sum_j \varphi_{3+j} BOND_j + \varepsilon$$

where:

α_4 is the model constant; and

$\varphi_{1..3+j}$ are the model coefficients.

This model in part replicates the regression in 7.4.1. Again, an iterative model-fitting process is used, particularly in dealing with the common bond dummy variables. The final multiple regression model obtained, as detailed in Table 7-10, is:

$$GAMMA = -1.784767 - 0.188488 BETA - 0.196104 LOGCAR + 0.123368 LOGASS - 0.105293 INDPUB$$

F = 16.94761 Significance of F = 0.0000

Table 7-10: Variables in Gamma Equation

Variable	φ	SE	t	p(t)
Constant	-1.784767	0.330922	-5.393	0.0000
BETA	-0.188488	0.067272	-2.802	0.0058
LOGCAR	-0.196104	0.088996	-2.204	0.0291
LOGASS	0.123368	0.020112	6.134	0.0000
INDPUB	-0.105293	0.076636	-1.374	0.1716

Similar inferences can be drawn from this model. *GAMMA* and *BETA* are inversely related. The coefficient of *LOGCAR* is significantly negative, demonstrating that the capital requirement has more impact on credit unions with lower capital ratios. Size is positively related to *GAMMA*, suggesting that larger institutions (with less effective common bonds) are more likely to change the portfolio mix away from personal loans, the traditional area of credit union lending. Consistent with the earlier finding, only the coefficient of *INDPUB* approaches statistical significance. The sign is negative, suggesting that a change in portfolio is a less likely response for this common bond sub-classification. The positive and negative coefficients for *INDPUB* in each model imply that industrial public sector credit unions are more likely to respond to the FI Scheme by increasing profitability instead of changing their loan portfolios.

7.5 Summary

The objective of this empirical analysis is to assess whether the impact of the FI Scheme on credit unions is consistent with the theoretical expectations drawn from the analysis in earlier chapters. To this end, three statistical procedures are undertaken using quarterly financial information for a sample of 150 NSW credit unions over the period 1987 to 1997. First, the impact on the pattern of reserve accumulation, using *ROA* as a proxy, is examined using intervention analysis, introduced in section 6.2.1. These results, viewed in isolation, are mixed in regard to the expectation that credit unions are likely to increase the rate of reserve accumulation due to the new capital adequacy requirement. Only 43% of

institutions rejected the null hypothesis of no impact, and of these, 66% had coefficients that were negative, rather than positive as predicted.

Second, the impact on loan portfolio preference is evaluated, due to data limitations, by a post-intervention trend analysis of the proportion of housing loans for each institution. These results provide much stronger support for the prediction that credit unions would increase the proportion of housing loans, since this form of lending carries much lower risk weighting under the prudential rules of the FI Scheme. Significant coefficients were estimated in 86% of the cases (56% at a significance level of 1%), and of these, 85% of the coefficients were positive, consistent with expectations. The consistently positive response in terms of portfolio mix partly explains the generally insignificant or negative results for the intervention analysis. Lending for residential mortgages suffers from lower yields and faces an increasingly competitive market, particularly in a period of low official interest rates and the entry of cut-price mortgage providers such as Aussie Home Loans and Rams.

Finally, the credit union behaviour is explained by the use of cross-sectional models of the responses to the regulation. Transformed coefficients are modelled in terms of each other, credit union size, common bond, and levels of regulatory capital at the commencement of the Scheme. The results indicate that:

- increasing reserves through greater profitability and changing the portfolio mix to emphasise housing loans are alternative strategies;

- smaller credit unions (presumably with more effective common bonds) are less likely to increase profitability or to emphasise housing loans in response to capital requirements;
- both strategies are more likely for institutions with lower levels of regulatory capital; and
- industrial public sector credit unions are more likely to look to increased profitability, rather than increased emphasis on housing, to meet capital requirements.

Chapter Eight reviews the thesis and discusses the implications of the results empirical analysis, particularly in the context of the Wallis Inquiry recommendations.

Chapter Eight
Conclusions

This thesis concludes with a review of the content, an identification of significant contributions, and expectations about the future of credit unions following the Wallis Inquiry.

8.1 Review

A major theme is that credit unions represent an institutional response to economic problems of information asymmetry. The literature on nonprofit organisations generally assumes that these problems are overcome by the existence of a nondistribution constraint. This approach is unsatisfactory, and in particular at odds with agency theory which suggests that the difficulties in using market-based disciplining mechanisms will lead to serious problems of management efficiency. The preferred view of nonprofit organisations is that the development of altruistic social norms and relationships of trust provide comparative informational advantages through encouragement of cooperation and facilitate non-pecuniary reward for managers. This is particularly so for mutual nonprofit organisations, including credit unions, where a community of interest between producers and consumers addresses information asymmetries in the relevant market. This argument is supported by transaction cost economics, which finds that internal

organisation of transactions to be a rational response to information impactedness.

Financial economics commonly argues that mutual institutions are inherently less efficient than open corporations, based on lack of clarity in the definition of property rights in residual risk bearing, and lack of access to market incentives. Such agency costs of equity may be exacerbated in mutual institutions, but the elimination of a separate class of shareholders should reduce the agency costs of debt, as the incentive to increase the risk of the institution is reduced. More importantly, mutual organisations are more likely to have a comparative advantage in credit markets due to severe problems of adverse selection and moral hazard. Rural and developing credit markets, German credit cooperatives, and savings and loan associations in the United States, provide examples of these information problems, and the effectiveness of mechanisms such as peer monitoring for dealing with information asymmetries. In this context, the credit union common bond of association represents a source of comparative institutional advantage in reinforcing mutuality, promoting altruistic behaviour, and enhancing screening and monitoring activities in lending.

Examination of recent credit union regulation reveals a trend away from institutional forms of regulation towards functional regulation, in the pursuit of competitive neutrality. Part of this policy, triggered by the Campbell Inquiry, involves the extension of prudential rules applicable to banks to all deposit-taking institutions. From the Brady Report emerged

an inter-State agreement to harmonise cooperatives and credit union legislation with uniform regulation through the FI Scheme. Although the Scheme eliminated inconsistencies between State laws, and formally reinforced some of the mutual characteristics of credit unions, the major change to operating principles is found in the imposition of a capital adequacy requirement, consistent with Reserve Bank supervision. This new prudential requirement is incompatible with the mutual organisational structure of a credit union, and is argued to reflect a failure by regulators to appreciate important institutional differences. Consequences of the measure are likely to include: profitability as the principal operating objective to accumulate surpluses; an increased preference for residential mortgage loans; constraints on growth; increased compliance costs for smaller credit unions; and merger activity to address problems of capital.

These predictions are tested empirically using a sample of 150 NSW credit unions over the period 1987 to 1997. Prior quantitative studies of credit unions reflect interests in industry structure, scale economies, and organisational behaviour, with the common bond a typical component of such studies. Intervention analysis, particularly in terms of the Box-Tiao form of time series analysis, provides an appropriate method for assessing the impact of regulation. The empirical study adopts this approach and is therefore consistent with a growing literature examining the effect of legislation. While the intervention analysis of the pattern of reserve accumulation generally shows insignificant or apparently confounding

results, this can be explained by the post-intervention trend analysis of the proportion of lending for residential mortgages. Considerable support is found for the prediction that credit unions would emphasise housing loans since these carry a lower risk weighting for the purposes of capital adequacy. The inverse relationship between profitability and proportion of mortgage lending is confirmed by cross-sectional regressions of the credit unions responses. Consistent with expectations, the response of credit unions to the FI Scheme is also a function of regulatory capital levels, common bond, and institution size (a proxy for member bonding).

8.2 Contributions

This thesis provides at least eight significant contributions. First, an alternative perspective is offered to the widely held view that the nondistribution constraint is the essential institutional feature for nonprofit organisations. Nonprofit organisations should be analysed in terms of the informational advantages flowing from relationships of trust amongst the membership, whether arising from embedded social norms, or from a coalition of producer and consumer interests in markets characterised by severe adverse selection and moral hazard.

Second, it is demonstrated that transaction costs economics can be applied to these issues of institutional form. Little progress has been made in applying transaction cost economics to situations of cooperatives (e.g. Bonus, 1986; Krashinsky, 1986; Staatz, 1987) and less so for the case of mutuals. Williamson (1985, p. 394) advocates further inquiry into

applications of transaction cost analysis to nonprofit forms of enterprise. Neoinstitutionalism provides a complementary perspective to the arguments based on information asymmetry.

Third, a counterpoint (consistent with Llewellyn and Holmes, 1991) is provided to an emerging conventional wisdom that mutuality is outdated and such institutions can and should convert to a shareholder-owned corporation. Economists studying the differing incentives of owners, borrowers and managers have typically done so within the context of shareholder companies, particularly with the discipline of the sharemarket. The usual assumption has been of a high degree of efficiency within these markets and the implied disciplining of managers through market-based processes. The coexistence of mutuals and other forms of institution has been hypothesised as arising from agency costs, adverse selection problems and the efficiency of risk-sharing arrangements. The economic analysis of credit unions generally deals, however, with only one aspect of a complex social movement. My claim is that credit unions are a distinct form of socio-economic organisation with important informational advantages in particular markets.

Fourth, an economic model of credit union behaviour is proposed. This model is based on an assumption of maximisation of manager utility (Keating, 1979; Williamson, 1974), subject to the influence of the common bond of association. The common bond reduces member-manager agency costs (particularly in screening, selection and socialisation processes), reinforces the principle of mutuality, provides informational advantages,

and is a proxy for other institutional advantages such as employer subsidies. The common bond should therefore be an important element of the economic analysis of credit union behaviour.

Fifth, a detailed analysis of the development of Australian credit union regulation, and the legislative changes introduced by the FI Scheme is undertaken. More importantly, an explanation of the nature of these changes - the policy of "competitive neutrality" - is provided.

Sixth, a theoretical assessment of the impact of the FI Scheme on credit unions is conducted, principally the imposition of a risk-weighted capital adequacy requirement. It is argued that this prudential regulation conflicts with the mutual structure of the credit union, through inappropriately assuming excessive risk-taking behaviour, and an ability to raise permanent capital. Likely consequences for operating policies, portfolio preferences, and industry structure are predicted.

Seventh, the empirical study of the impact of the FI Scheme on credit unions is significant because no similar Australian study has been published. Also of significance is the use of intervention analysis to study the impact of a regulatory change. The results therefore make an important contribution to the growing literature using this technique.

Finally, this work promotes greater cognisance of possible unintended consequences from government intervention. The imposition of inappropriate supervisory mechanisms on credit unions arises from a failure to appreciate important institutional differences. This creates a

"regulatory paradox" (Sunstein, 1990). Policy makers need to have a thorough understanding of the actual consequences of regulatory programmes. Analytical rigour is needed in the planning and implementation of public policy. The important message is that regulators should be aware of the distinct institutional and economic differences between credit unions as mutual organisations and other forms of financial intermediaries. In short, this thesis agrees with the position of Bundt, Chiesa and Keating (1989, p. 27) that:

> [R]egulators, by systematically ignoring the rich behavioural dynamics of the relationships among members in the financial cooperative, may pursue actions that will hamper the social utility of the cooperative's members as well as lead to a socially inefficient allocation of savings flows.

8.3 Limitations and Further Research

This thesis uses a theoretical approach to the question of credit union organisation that is based principally on information asymmetry and institutional economics literatures. Other approaches, particularly themes emergent within behavioural economics literatures (Earl, 1988), might also have provided some valuable insights into these social institutions.

For example, propositions might be developed from a framework of competency (Foss, 1998) rather than information impactedness and opportunism. This approach would emphasise the financial competencies of both the borrower and the credit union manager-lender. An important element of such an analysis would be the kind of

information social networks are in fact able to convey to credit unions. The usefulness of such information in turn depends on whether financial risk arises from calculated guile or mere incompetence. Guile can include the management of impression within social settings as a form of deliberate miscommunication (Goffman, 1956, 1969). The economic psychology of problem debt (Milgrom and Roberts, 1992) is an obvious area for further exploration of the role of the credit union in mediating information flows.

Direct empirical testing of these alternative propositions, as well as those presented in this thesis, would require the use of a more qualitative methodology involving questionnaire, interview and case studies of individual Australian credit unions. Such fieldwork would be able to more directly observe loan approval and monitoring processes, screening of applicants (and managers), constitution and operation of committees, and information-gathering procedures. This wider issue of ethnographic realism of the theoretical propositions presented in earlier chapters is, however, beyond its scope of this thesis.

8.4 The Future

The future facing credit unions following the Financial System Inquiry (Wallis Inquiry, 1997) is considered. This Report adopted a similar deregulatory philosophy to that of Campbell (Greinke, 1998). The essential recommendation is that all prudential regulation functions be rationalised into a single national regulator to be termed the Australian

Prudential Regulation Commission (Recommendation 31). Inherent in this recommendation is the intention to repeal the FI Scheme and replace it with a federal regulatory framework. The report stated (1997, p. 307):

> While the FI Scheme has raised the prudential standing of institutions supervised, it has failed to deliver uniformity, cost efficiency or regulatory neutrality either across industries supervised or with competitors in the wider financial system. The excessive layering in the structure has resulted in duplication of supervisory, policy and administrative arrangements; slow decision making in important areas, including legislative review; and conflicts between those making policy and those implementing it.

The Commonwealth has since legislated to establish the new prudential regulator, the Australian Prudential Regulation Authority (APRA), which by 1 July 1999 will assume the prudential functions of AFIC and the SSAs and end the operation of the FI Scheme. The corporate regulation of financial institutions will be undertaken by the Australian Securities and Investments Commission (ASIC). One consequence of this consolidation of prudential supervision into a single agency is the continuation of bank style risk-weighted capital adequacy requirements applied across the sector (Recommendation 35):

> Prudential regulation of all licensed DTIs should be consistent with standards approved by the Basle Committee on Banking Supervision and should aim to ensure that the risk of loss of depositors' funds is remote. Quantitative prudential requirements *such as capital adequacy,* liquidity requirements and large exposure limits should apply. (emphasis added)

Indeed, in 1997/98 AFIC embarked on a harmonisation programme for its prudential standards ahead of the transfer to APRA, described as its "major undertaking" for that financial year to "bring them into line with

APRA's standard for banks" (AFIC, 1998, pp. 6, 11). From 1 October 1998, the capital adequacy regimes for all deposit taking institutions will be almost identical. The prudential rules, however, already closely reflect those applying to banks. On this basis, the FI Scheme might be characterised as "revolutionary" and the Wallis consequences as "evolutionary" (De Gruchy, 1997).

A fundamental concern, based on the arguments in this thesis, is that the Wallis Inquiry unduly concentrates on the similarities, rather than the differences, between financial institutions (Neal, 1997, p. 25). Regulation treating credit unions as no different from building societies or banks may have self-fulfilling qualities. Principally, the competitive neutrality objective will maintain pressure to erode important institutional differences, such as mutuality, and the relationship between credit union members reflected in the common bond of association. The current trend is for the common bond of membership to be broadened and, in effect, many credit unions have become community credit unions (Stanford and Beale, 1995, p. 42). Indeed, the common bond appears to be of such little concern to the prudential regulators that AFIC recently stated that "a common bond for credit union membership is no longer required" (AFIC, 1998, p. 25). As this is at odds with the FI Code, it appears that in practice, the requirement for a common bond is being systematically overlooked by AFIC. Based on this trend, APRA might abandon the common bond entirely as an essential operating principle for credit unions.

If the common bond is not perceived as important by regulators, then the

associated organisational benefits of altruism, and managerial motivation through screening, selection and socialisation will be eroded. An increased recruitment of managers from profit-oriented financial institutions is a natural consequence, particularly for smaller credit unions dealing with increasingly complex regulatory responsibilities. Indeed, it has been argued by AFIC that (De Gruchy, 1997):

> [Credit unions] need to find adequately skilled management and quality for their boards. Without this, how can an institution effectively plan for growth and profitability?

Another foreseeable trend is demutualisation of credit unions to change the institutional form into one better suited to the assumptions of the regulators (Davis, 1994). Cooperative entities, in facing new financial conditions or regulation, can be induced to adopt structural changes that lead, consciously or not, to a loss of their cooperative nature (Kaplan de Drimer, 1997). Davis (1997) identifies demutualisation as a significant trend in the process of Australian financial restructuring. Demutualisation may be prompted by the accumulation of reserves, due to the capital adequacy requirement, as these reserves grew significantly in aggregate since the introduction of the FI Scheme. Expropriation of this communal wealth by the current membership may provide an incentive for credit union members to demutualise. Share capital has importance to open corporations in dealing with a number of agency problems. The perceived benefits of permanent share capital will become more prominent if the comparative advantages of mutuality are ignored or eroded. There is evidence that regulators are moving towards facilitating

the widespread use of share capital in the credit union industry. On 21 August 1998, AFIC resolved (PR17/98) to amend the prudential standards to issue a special form of share capital, not merely subordinated debt, in order "to support growth targets". The provisions if the FI Code prohibiting issue of shares by credit unions can be indirectly repealed for an individual institution by proclamation of a regulation "prescribing" that society. The prescription of a credit union effectively deems it a building society for the purposes of issuing permanent share capital (FI Code ss. 148, 200 and 216). This standard intends to preserve the mutual character of a credit union by requiring maintenance of the one-member-one-vote principle, and by limiting participation in any surplus on winding up to members as a class rather than shareholders. It is arguable, however, that such share issues have the capacity to undermine the mutual structure, should directors be inclined to value maximisation of shareholder return over promotion of member benefits. The foreshadowed infusion of professional managers and directors to the industry make such an outcome more likely.

Mergers are likely to continue, leading to further concentration of the industry. Recently, de Gruchy (1997) stated:

> Consideration of future strategies [by institutions] will undoubtedly include formation of alliances and possible mergers. . . Many believe that the rate of rationalisation over the next few years will escalate.

Merger combined with demutualisation may be a new trend. Crystallisation of the property rights in reserves may be attractive, for

example, to shareholders of a building society. Regulators are already acting to provide avenues for demutualisation. On 24 June 1998, AFIC resolved (PR15/98) to make a prudential standard to facilitate demutualisation of credit unions, partly for the purpose of potential merger with building societies.

A final observation is made: credit unions have a strong sense of social responsibility, but the importance of this role is not apparently shared by regulators. Indeed, in discussing potential community service obligations of financial institutions, the following was stated (Wallis Inquiry, 1997, p. 195):

> Financial institutions, like other business corporations, are designed to produce wealth, not to redistribute it . . . Obliging financial institutions to subsidise some activities compromises their efficiency and is unlikely to prove sustainable in a competitive market.

Credit unions are, however, likely to have positive social value without the mandate to be a competitive element of an efficient financial system. Freedom for mutuals without pressure to perform on profits and growth permits engagement in activities that are not profit-oriented, such as improvement of community interests. Recognition of important differences, particularly mutuality and the role of the common bond of association, are essential if credit unions are to continue their historical role of social improvement.

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Appendix One Results of Intervention Analysis

A1.1 Model Coefficients

β	Variable coefficient
t	Student's t-statistic for coefficient
p(t)	Significance of t (p-value)
LinR	Linear Regression (no time series process)
AR(1), AR(2)	First-, second-order autoregressive processes
step_91, step_93	Step dummy variable for 1st Quarter 1991 or 1993
pulse_1 . . . _3	Pulse dummy variables
const	Model constant

Institution	Model	Variable	β	t	p(t)
ACFE	LinR	step_93	-0.001661	-2.886	0.0064
		const	0.003706	9.110	0.0000
ADCU	AR(1)	AR(1)	0.721097	6.960	0.0000
		step_91	0.006367	2.799	0.0081
		const	0.000947	0.443	0.6603
AGLG	AR(1)	AR(1)	0.620352	3.897	0.0004
		step_93	0.000977	0.994	0.3266
		const	0.001463	1.923	0.0622
AGRI	AR(2)	AR(1)	-0.304206	-1.842	0.0737
		AR(2)	-0.397041	-2.446	0.0195
		step_91	-0.002403	-10.869	0.0000
		const	0.003284	17.807	0.0000
ALBU	LinR	step_93	-0.003178	-2.737	0.0095
		pulse_1	0.026669	7.172	0.0000
		const	0.003901	4.692	0.0000

AMPE	LinR	step_91	0.001752	2.366	0.0233
		const	0.002306	4.922	0.0000
ASQU	AR(1)	AR(1)	-0.548831	-3.848	0.0005
	sar4	step_93	0.020085	1.410	0.1678
		const	-0.003909	-0.866	0.3925
AUBU	AR(1)	AR(1)	-0.682572	-5.158	0.0000
	sar4	step_93	0.006675	1.752	0.0891
		const	-0.001057	-0.877	0.3868
AUDI	AR(1)	AR(1)	-0.557591	-3.470	0.0021
		step_91	-0.001977	-0.286	0.7771
		const	0.000475	0.225	0.8239
AVIA	LinR	step_93	-0.001352	-1.262	0.2148
		const	0.005247	6.923	0.0000
BANA	AR(1)	AR(1)	0.735991	6.041	0.0000
		step_93	0.000902	1.013	0.3194
		const	0.004580	6.267	0.0000
BAND	LinR	step_91	0.000541	0.686	0.4967
		const	0.000154	0.234	0.8164
BANK	LinR	pulse_1	0.006486	2.342	0.0248
		step_91	0.002212	1.795	0.0810
		step_93	-0.002280	-2.004	0.0526
		const	0.004042	5.188	0.0000
BCCC	AR(1)	AR(1)	-0.406394	-2.772	0.0088
		step_91	0.000699	0.724	0.4736
		pulse_1	0.014001	3.842	0.0005
		const	0.001657	2.009	0.0521
BCUL	LinR	step_93	0.000189	0.242	0.8103
		const	0.004057	7.334	0.0000
BEMB	AR(2)	AR(1)	-0.100307	-0.689	0.4953
		AR(2)	-0.488595	-3.362	0.0018
		step_93	0.002285	1.635	0.1108
		const		2.480	0.0180
BERR	LinR	step_93	-0.000649	-1.031	0.3091

		const	0.003076	6.906	0.0000
BIGR	AR(1)	AR(1)	0.248245	1.448	0.1563
		step_91	-0.001612	-2.430	0.0202
		pulse_1	0.002313	1.580	0.1228
		const	0.005153	9.263	0.0000
BLMO	AR(1)	AR(1)	0.463565	3.095	0.0038
		step_91	0.003398	3.385	0.0017
		pulse_1	-0.007498	-4.721	0.0000
		const	-0.000720	-0.837	0.4081
BORA	AR(1)	AR(1)	0.342452	2.217	0.0328
		step_93	-0.001836	-1.416	0.1651
		const	0.003047	3.263	0.0024
BORG	LinR	pulse_1	-0.015941	-3.689	0.0007
		step_91	-0.001455	-0.988	0.3295
		const	0.004566	3.728	0.0006
BRAM	LinR	step_91	-0.001968	-1.745	0.0891
		const	0.004632	4.907	0.0000
BROK	AR(1)	AR(1)	0.444511	2.892	0.0064
		step_93	-0.001573	-3.090	0.0038
		const	0.003615	9.714	0.0000
BROO	LinR	step_93	-0.001345	-1.810	0.0783
		const	0.003140	5.976	0.0000
BTRE	LinR	step_91	0.001371	0.769	0.4465
		const	0.002426	1.627	0.1120
CALA	LinR	step_93	0.001020	1.068	0.2921
		const	0.002837	4.203	0.0002
CAMP	AR(2)	AR(1)	-0.026959	-0.143	0.8876
		AR(2)	-0.519794	-2.830	0.0090
		step_91	0.001096	1.164	0.2553
		const	0.001309	1.835	0.0785
CAPE	AR(1)	AR(1)	-0.312619	-1.626	0.1128
		step_91	0.001884	2.883	0.0067
		step_93	-0.001615	-2.674	0.0113

		pulse_1	0.012695	7.000	0.0000
		const	0.002466	-2.674	0.0113
CAPR	LinR	step_93	-0.001097	-1.998	0.0529
		const	0.003601	9.278	0.0000
CARE	LinR	step_93	0.000990	0.610	0.5464
		const	0.004362	4.389	0.0001
CBOA	AR(1)	AR(1)	-0.349837	-2.269	0.0292
		step_93	-0.000299	-1.199	0.2381
		const	0.003966	22.608	0.0000
CDHC	LinR	step_91	0.001719	0.673	0.5050
		const	0.001394	0.652	0.5182
CESS	LinR	step_91	-0.004855	-1.891	0.0663
		const	0.006441	2.999	0.0048
CIBA	LinR	step_93	0.002161	1.530	0.1350
		const	0.001043	1.089	0.2837
CITY	LinR	step_93	-0.001381	-2.793	0.0097
		pulse_1	0.005648	3.485	0.0013
		const	0.003663	10.106	0.0000
CLAR	LinR	step_91	-0.002249	-1.539	0.1345
		const	0.005512	4.818	0.0000
COAS	LinR	step_93	-0.000097	-0.156	0.8769
		const	0.003141	7.123	0.0000
COMF	LinR	step_91	0.000999	1.385	0.1767
		pulse_1	0.056384	28.096	0.0000
		const	0.000238	4.115	0.0003
COMP	LinR	step_93	-0.000479	-1.478	0.1476
		const	0.003314	14.451	0.0000
COMT	LinR	step_91	0.001571	1.925	0.0617
		const	0.001679	2.459	0.0186
CSRE	LinR	step_91	0.001224	1.537	0.1326
		const	0.001602	2.404	0.0212
CWCU	LinR	step_93	0.000526	0.143	0.8868
		const	0.003207	1.235	0.2243

DEPE	LinR	step_91	0.000260	0.502	0.6189
		const	0.003227	7.452	0.0000
DUBB	LinR	step_93	-0.002189	-2.077	0.0466
		const	0.004971	6.670	0.0000
ECUL	LinR	step_91	-0.001761	-2.406	0.0212
		const	0.002424	3.980	0.0003
EDCU	LinR	step_93	0.003259	2.789	0.0100
		const	0.001563	2.628	0.0145
ELCO	AR(1)	AR(1)	0.431677	2.716	0.0144
		step_93	-0.000696	-0.854	0.3993
		const	0.004450	7.117	0.0000
ENDE	LinR	step_93	-0.000410	-0.824	0.4155
		pulse_1	0.032342	20.548	0.0000
		pulse_2	0.005060	3.215	0.0028
		const	0.004475	12.716	0.0000
ESSO	LinR	step_93	-0.001179	-2.591	0.0135
		const	0.003929	12.212	0.0000
EURO	LinR	step_93	0.002250	1.479	0.1474
		const	0.003280	3.049	0.0042
FBEC	AR(1)	AR(1)	-0.266171	-1.684	0.1006
		step_91	0.001079	0.803	0.4270
		const	0.003157	2.814	0.0078
FIRS	AR(1)	AR(1)	-0.407333	-2.725	0.0098
		step_93	-0.000692	-0.493	0.6249
		const	0.005542	5.616	0.0000
FORS	LinR	step_93	-0.001764	-2.165	0.0367
		const	0.004149	7.204	0.0000
GIOS	LinR	step_91	0.000792	0.761	0.4515
		const	0.002007	2.304	0.0268
GOSF	LinR	step_91	0.000352	0.582	0.5646
		const	0.004353	8.159	0.0000
GRAN	LinR	step_93	0.002004	0.666	0.5094
		pulse_1	0.239861	24.895	0.0000

		const	0.002102	1.001	0.3232
GREA	LinR	step_91	0.001641	2.767	0.0087
		const	0.003516	7.083	0.0000
HARD	LinR	step_91	-0.001411	-1.848	0.0724
		const	0.003586	5.612	0.0000
HIBE	AR(1)	AR(1)	0.872555	11.760	0.0000
	sar4	step_91	0.001827	2.182	0.0373
		const	0.003311	2.275	0.0305
HMCS	LinR	step_93	-0.001497	-4.441	0.0001
		const	0.003325	13.952	0.0000
HOLI	AR(1)	AR(1)	0.690541	5.909	0.0000
		step_93	-0.001741	-2.277	0.0287
		const	0.003700	5.947	0.0000
HORI	LinR	step_93	-0.000705	-1.711	0.0954
		pulse_1	0.027155	20.583	0.0000
		const	0.002784	9.684	0.0000
HUUN	LinR	step_93	-0.001365	-3.011	0.0046
		const	0.004198	13.100	0.0000
ILLW	AR(1)	AR(1)	0.315883	2.065	0.0460
		step_93	-0.001383	-2.211	0.0333
		const	0.003737	8.314	0.0000
INTE	LinR	step_91	-0.000923	-1.013	0.3176
		const	0.007003	9.187	0.0000
KARP	LinR	step_93	-0.001382	-2.335	0.0251
		pulse_1	0.004840	2.553	0.0149
		const	0.004342	10.508	0.0000
LABO	LinR	step_93	-0.002487	-1.293	0.2040
		const	0.004833	3.552	0.0010
LABS	LinR	step_91	0.000576	1.553	0.1308
		const	0.004646	15.853	0.0000
LECU	AR(1)	AR(1)	0.341564	2.223	0.0324
		step_93	-0.001340	-1.745	0.0893
		const	0.003879	7.011	0.0000

LMCU	LinR	step_93	-0.001388	-2.106	0.0418
		const	0.003683	7.905	0.0000
LSCU	LinR	step_93	0.000335	0.552	0.5840
		const	0.001771	4.132	0.0002
MACO	LinR	step_91	-0.004497	-4.737	0.0000
		const	0.007710	9.707	0.0000
MACQ	LinR	step_93	-0.000514	-0.520	0.6059
		const	0.006692	9.582	0.0000
MAIT	LinR	step_93	0.001464	0.702	0.4872
		const	0.001260	0.854	0.3933
MANL	LinR	step_91	-0.000757	-0.287	0.7759
		const	0.002779	1.258	0.2162
MANN	AR(1)	AR(1)	0.358256	2.184	0.0354
		step_93	-0.000550	-0.624	0.5366
		const	0.005443	8.545	0.0000
MARI	AR(1)	AR(1)	0.393947	2.535	0.0157
		step_91	-0.000846	-0.963	0.3421
		pulse_1	-0.008754	-5.610	0.0000
		const	0.003636	4.886	0.0000
MAWA	LinR	step_93	-0.000908	-2.209	0.0333
		const	0.003623	12.463	0.0000
MCUL	LinR	step_91	0.001203	1.644	0.1085
		const	0.003184	5.201	0.0000
MINN	LinR	step_91	0.001158	0.416	0.6798
		const	0.003088	1.333	0.1906
MMCU	LinR	step_91	-0.000791	-1.011	0.3186
		const	0.004314	6.591	0.0000
MONI	LinR	step_91	0.000404	0.647	0.5220
		const	0.003170	6.168	0.0000
MSBC	LinR	step_91	-0.001813	-4.573	0.0000
		const	0.003699	11.153	0.0000
MUCL	LinR	step_93	0.000632	0.325	0.7471
		const	0.004407	3.201	0.0028

NBUS	LinR	step_93	0.000273	0.321	0.7499
		pulse_1	0.018029	6.618	0.0000
		const	0.004148	6.986	0.0000
NCIT	AR(1)	AR(1)	0.271838	1.756	0.0876
		step_91	0.006092	2.755	0.0092
		step_93	-0.004625	-2.264	0.0297
		const	0.000622	0.428	0.6713
NCOM	LinR	step_93	0.002589	2.200	0.0340
		const	0.001417	1.702	0.0969
NDIS	LinR	step_93	-0.001998	-2.161	0.0370
		const	0.004287	6.557	0.0000
NENG	LinR	step_91	0.002014	2.922	0.0058
		const	0.002257	3.913	0.0004
NEWC	LinR	step_93	-0.006031	-2.287	0.0279
		const	0.015902	8.526	0.0000
NIND	LinR	step_91	0.000797	1.336	0.1903
		const	0.003028	5.759	0.0000
NOVA	LinR	step_91	-0.000594	-0.783	0.4386
		pulse_1	0.018522	8.312	0.0000
		const	0.003776	5.978	0.0000
NRIV	AR(1)	AR(1)	0.403557	2.668	0.0113
		step_91	-0.000397	-0.564	0.5763
		const	0.003460	5.781	0.0000
NRMA	LinR	step_91	-0.000368	-0.397	0.6932
		const	0.003351	4.327	0.0001
NSUN	LinR	step_91	-0.001870	-2.125	0.0416
		const	0.003895	5.551	0.0000
NSWP	AR(2)	AR(1)	-0.498403	-3.308	0.0021
		AR(2)	-0.428769	-2.888	0.0065
		step_91	-0.000401	-0.460	0.6480
		const	0.001775	2.444	0.0196
NSWT	LinR	step_93	0.000769	1.861	0.0705
		const	0.002750	9.414	0.0000

NWLG	LinR	step_91	-0.000456	-0.235	0.8157
		const	0.004317	7.770	0.0000
ORAN	LinR	step_91	-0.000742	-1.516	0.1377
		const	0.003731	9.116	0.0000
ORIO	LinR	step_93	0.000718	0.959	0.3449
		pulse_1	0.029576	13.574	0.0000
		const	0.003209	6.587	0.0000
ORMU	LinR	step_91	-0.000216	-0.490	0.6267
		const	0.003682	11.844	0.0000
PARK	LinR	step_91	0.001044	0.670	0.5067
		const	0.003686	2.829	0.0074
PBBC	LinR	step_91	-0.006539	-0.648	0.5210
		pulse_1	-0.017430	-5.885	0.0000
		const	0.003036	3.616	0.0009
PCUL	LinR	step_93	0.000832	2.251	0.0302
		const	0.003083	11.802	0.0000
PEEL	LinR	step_93	-0.001968	-5.662	0.0000
		pulse_1	0.024858	22.326	0.0000
		const	0.004477	17.982	0.0000
PENR	LinR	step_93	0.001672	1.516	0.1385
		pulse_1	0.029965	8.708	0.0000
		const	0.002312	3.092	0.0039
PHOE	AR(1)	AR(1)	0.309952	1.966	0.0569
		step_93	-0.001426	-2.463	0.0186
		const	0.003958	9.517	0.0000
POWE	LinR	step_91	-0.001185	-1.771	0.0848
		pulse_1	0.017140	8.726	0.0000
		const	0.002685	4.735	0.0000
PROS	AR(1)	AR(1)	0.489145	3.402	0.0017
		step_91	0.000684	1.034	0.3082
		pulse_1	0.002746	2.743	0.0094
		const	0.002593	4.561	0.0001
PTOS	LinR	step_91	-0.002822	-3.282	0.0027

		const	0.004380	6.506	0.0000
PUNC	LinR	step_93	-0.000851	-1.216	0.2318
		pulse_1	-0.046613	-21.060	0.0000
		pulse_2	0.004671	2.110	0.0419
		const	0.003912	7.905	0.0000
QANT	LinR	step_91	0.001969	3.597	0.0090
		const	0.001126	2.459	0.0186
RALE	LinR	step_93	-0.001695	-2.547	0.0150
		const	0.003371	7.162	0.0000
RAND	LinR	step_93	-0.001388	-1.345	0.1866
		const	0.005239	7.177	0.0000
RELI	LinR	step_93	-0.001206	-1.816	0.0779
		pulse_1	0.053838	25.950	0.0000
		pulse_2	0.046653	22.487	0.0000
		pulse_3	0.016437	7.934	0.0000
		const	0.002993	6.289	0.0000
RESO	AR(1)	AR(1)	0.454140	3.166	0.0031
		step_91	0.000801	0.663	0.5113
		const	0.003328	3.228	0.0026
ROTH	LinR	step_93	-0.001440	-1.892	0.0661
		const	0.003308	6.146	0.0000
RTAS	AR(1)	AR(1)	-0.640629	-5.190	0.0000
		step_93	0.000492	1.331	0.1912
		const	0.002437	9.381	0.0000
RYDE	LinR	step_93	-0.000391	-0.595	0.5551
		const	0.002560	5.512	0.0000
RYOM	LinR	step_93	0.001133	1.176	0.2484
		pulse_1	0.021023	7.293	0.0000
		const	0.001798	2.808	0.0084
SCCU	LinR	step_91	0.000270	0.523	0.6043
		const	0.002051	4.738	0.0000
SCEC	AR(2)	AR(1)	-0.627057	-3.925	0.0006
		AR(2)	-0.565488	-3.589	0.0014

		step_93	0.001532	1.941	0.0636
		const	0.002244	5.343	0.0000
SECU	LinR	step_93	-0.000377	-0.488	0.6287
		const	0.003798	6.947	0.0000
SELE	LinR	step_93	-0.000703	-1.196	0.2393
		pulse_1	0.022366	11.878	0.0000
		const	0.003081	7.508	0.0000
SHEL	AR(1)	AR(1)	0.382660	2.576	0.0141
		step_93	-0.002320	-3.487	0.0013
		const	0.005319	11.043	0.0000
SHOA	LinR	step_91	0.001236	1.954	0.0607
		const	0.002645	5.401	0.0000
SNOW	LinR	step_91	0.002397	3.135	0.0033
		const	0.001169	1.828	0.0754
SPAP	AR(1)	AR(1)	0.783381	8.637	0.0000
	sar4	step_93	0.001072	1.551	0.1293
		const	0.002035	2.431	0.0200
STGE	LinR	step_93	0.001409	1.185	0.2435
		pulse_1	0.038773	10.186	0.0000
		const	0.003117	3.663	0.0008
STHE	LinR	step_93	-0.001337	-1.442	0.1575
		const	0.004661	7.111	0.0000
SUMM	AR(1)	AR(1)	0.631912	5.099	0.0000
		step_93	-0.000484	-0.451	0.6543
		pulse_1	0.007005	5.325	0.0000
		const	0.002975	3.557	0.0011
SUTH	LinR	step_93	0.000428	0.218	0.8290
		const	0.003040	2.185	0.0351
SWSC	AR(1)	AR(1)	0.503545	3.534	0.0011
		step_91	0.003200	1.391	0.1726
		const	0.001835	0.928	0.3594
SYDN	AR(1)	AR(1)	0.403333	2.391	0.0223
		step_93	-0.000633	-1.719	0.0944

		pulse_1	0.003816	5.529	0.0000
		pulse_2	0.006772	9.813	0.0000
		const	0.003249	12.148	0.0000
TABS	LinR	step_93	0.000242	0.167	0.8683
		pulse_1	-0.005535	-1.192	0.2407
		const	0.002268	2.242	0.0310
TAFE	LinR	step_91	-0.003071	-1.707	0.0960
		const	0.008119	5.394	0.0000
TART	LinR	step_91	0.002974	1.703	0.0970
		step_93	-0.003247	-2.028	0.0498
		const	0.008323	7.535	0.0000
TCUL	LinR	step_91	0.000516	0.734	0.4675
		pulse_1	0.059412	28.967	0.0000
		pulse_2	0.032003	16.004	0.0000
		const	0.002667	4.504	0.0001
TELS	AR(1)	AR(1)	0.457013	3.176	0.0030
		step_91	0.001638	1.378	0.1765
		const	0.001282	1.263	0.2145
TRAN	AR(1)	AR(1)	0.401979	2.549	0.0151
		step_93	-0.003087	-4.522	0.0001
		const	0.004038	8.146	0.0000
TWSH	AR(1)	AR(1)	0.652431	5.436	0.0000
	sar4	step_93	0.001905	0.646	0.5226
		const	-0.000890	-0.320	0.7508
UAOD	LinR	step_93	0.000328	0.579	0.5668
		pulse_1	0.001856	1.083	0.2867
		const	0.001970	0.514	0.6106
UNIC	LinR	step_91	0.000194	0.355	0.7243
		const	0.001988	4.353	0.0010
UPPE	LinR	step_91	0.001195	1.806	0.0788
		const	0.002817	5.091	0.0000
WAGG	LinR	step_93	-0.002006	-1.859	0.0710
		pulse_1	-0.012946	-3.747	-0.0006

		const	0.004074	5.411	0.0000
WBDE	LinR	step_91	-0.002071	-3.412	0.0015
		const	0.005136	10.114	0.0000
WEST	LinR	step_93	-0.000988	-1.950	0.0588
		pulse_1	0.029226	18.019	0.0000
		const	0.003447	9.504	0.0000
WILL	AR(1)	AR(1)	-0.407366	-3.250	0.0025
		step_91	-0.000601	-0.361	0.7200
		pulse_1	-0.019881	-3.166	0.0031
		const	0.004173	3.033	0.0045
WYON	LinR	step_91	0.000851	1.691	0.0991
		const	0.003231	7.669	0.0000
YENN	LinR	step_91	0.000466	0.777	0.4420
		const	0.003439	6.851	0.0000

A1.2 Diagnostics

Linear Regressions:

F — F-statistic

p(F) — Significance of F (p-value)

DW — Durbin-Watson statistic

Autoregressive models:

AIC — Aikike's Information Criterion

Institution	F	p(F)	DW	AIC
ACFE	8.33142	0.0064	1.7688	
ADCU				-353.7353
AGLG				-405.8824
AGRI				-431.8340
ALBU	33.46635	0.0000	2.4054	
AMPE	4.58926	0.0166	1.8608	
ASQU				-128.5177

AUBU				-217.5424
AUDI				-147.5544
AVIA	1.59156	0.2148	2.3638	
BANA				-345.1739
BAND	0.47090	0.4967	2.1439	
BANK	3.08373	0.0394	2.0597	
BCCC				-331.7607
BCUL	0.05842	0.8103	2.3676	
BEMB				-281.9259
BERR	1.06285	0.3091	1.7198	
BIGR				-402.9253
BLMO				-390.7567
BORA				-352.6718
BORG	7.75913	0.0015	1.9917	
BRAM	3.04341	0.0891	1.9940	
BROK				-438.1058
BROO	3.27490	0.0783	2.0377	
BTRE	0.59178	0.4465	2.2314	
CALA	1.14154	0.2921	1.7456	
CAMP				-238.9690
CAPE				-386.0024
CAPR	3.99292	0.0529	2.3085	
CARE	0.37227	0.5464	2.3625	
CBOA				-432.3264
CDHC	0.45298	0.5050	2.0086	
CESS	3.57631	0.0663	2.2959	
CIBA	2.34095	0.1350	2.1326	
CITY	11.61531	0.0001	1.9654	
CLAR	2.36992	0.1345	2.2110	
COAS	0.02431	0.8769	1.3689	
COMF	408.58405	0.0000	2.0632	
COMP	2.18452	0.1476	1.7854	
COMT	3.70576	0.0617	2.1986	

CSRE	2.36258	0.1326	1.6837	
CWCU	0.02055	0.8868	2.3855	
DEPE	0.25153	0.6189	2.3176	
DUBB	4.31323	0.0446	2.0215	
ECUL	5.79030	0.0212	2.1874	
EDCU	7.78049	0.0100	2.0420	
ELCO				-362.4261
ENDE	148.64401	0.0000	1.3841	
ESSO	6.71224	0.0135	2.1049	
EURO	2.18727	0.1474	1.4198	
FBEC				-309.8253
FIRS				-290.8374
FORS	4.68693	0.0367	2.0797	
GIOS	0.57866	0.4515	2.2360	
GOSF	0.33843	0.5646	1.8266	
GRAN	321.00139	0.0000	2.5388	
GREA	7.65542	0.0087	2.0090	
HARD	3.41387	0.0724	1.8787	
HIBE				-310.9245
HMCS	19.72273	0.0001	1.6507	
HOLI				-434.4782
HORI	213.11834	0.0000	1.4825	
HUUN	9.06710	0.0046	1.7512	
ILLW				-408.3606
INTE	1.02571	0.3176	1.7968	
KARP	5.16330	0.0105	1.9344	
LABO	1.67082	0.2040	2.6056	
LABS	2.41303	0.1308	2.4357	
LECU				-394.4710
LMCU	4.43654	0.0418	1.9595	
LSCU	0.30502	0.5840	2.2711	
MACO	22.44050	0.0000	2.5547	
MACQ	0.27065	0.6059	2.0164	

MAIT	0.49150	0.4872	2.2237	
MANL	0.08216	0.7759	1.9419	
MANN				-385.0223
MARI				-394.0111
MAWA	4.88030	0.0333	2.5686	
MCUL	2.70158	0.1085	1.7165	
MINN	0.17305	0.6798	1.7674	
MMCU	1.02116	0.3186	2.0258	
MONI	0.41838	0.5220	1.2545	
MSBC	20.91642	0.0000	1.9314	
MUCL	0.10547	0.7471	1.7218	
NBUS	22.87798	0.0000	2.2632	
NCIT				-326.4374
NCOM	4.83889	0.0340	1.8459	
NDIS	4.67189	0.0370	2.2873	
NENG	8.53602	0.0058	1.9262	
NEWC	5.22832	0.0279	1.2920	
NIND	1.78604	0.1903	1.7405	
NOVA	34.54566	0.0000	2.2592	
NRIV				-413.4493
NRMA	0.15798	0.6932	1.8883	
NSUN	4.51744	0.0416	2.2071	
NSWP				-312.2725
NSWT	3.46253	0.0705	1.6692	
NWLG	0.05511	0.8157	2.1497	
ORAN	2.29976	0.1377	2.1633	
ORIO	92.65867	0.0000	2.1802	
ORMU	0.24040	0.6267	1.6342	
PARK	0.44943	0.5067	1.7600	
PBBC	18.12402	0.0000	1.4175	
PCUL	5.06823	0.0302	1.4749	
PEEL	293.00413	0.0000	1.4648	
PENR	42.62878	0.0000	2.3882	

PHOE				-413.9351
POWE	46.18250	0.0000	2.1134	
PROS				-426.7628
PTOS	10.77251	0.0027	2.2347	
PUNC	151.42476	0.0000	1.5493	
QANT	12.93864	0.0009	1.9360	
RALE	6.48624	0.0150	1.9149	
RAND	1.80859	0.1866	2.0834	
RELI	313.86656	0.0000	2.4085	
RESO				-375.5137
ROTH	3.58039	0.0661	1.6295	
RTAS				-385.2965
RYDE	0.35453	0.5551	2.2632	
RYOM	29.92936	0.0000	1.4796	
SCCU	0.27314	0.6043	1.8816	
SCEC				-233.3368
SECU	0.23767	0.6287	1.7664	
SELE	70.80241	0.0000	1.6420	
SHEL				-410.1241
SHOA	3.81915	0.0607	2.5455	
SNOW	9.82634	0.0033	1.5994	
SPAP				-407.1479
STGE	51.98321	0.0000	2.2965	
STHE	2.07935	0.1575	1.8479	
SUMM				-399.4176
SUTH	0.04732	0.8290	2.0315	
SWSC				-329.1908
SYDN				-458.1593
TABS	0.71131	0.4976	2.2933	
TAFE	2.91414	0.0960	2.2868	
TART	2.17983	0.1274	2.1027	
TCUL	372.94460	0.0000	1.7626	
TELS				-377.1036

TRAN				-410.0513
TWSH				-275.2401
UAOD	0.67438	0.5164	2.2665	
UNIC	0.12629	0.7243	1.8523	
UPPE	3.26296	0.0788	2.0305	
WAGG	10.12387	0.0003	1.4148	
WBDE	11.64225	0.0015	1.7530	
WEST	174.34669	0.0000	1.8670	
WILL				-284.3720
WYON	2.85814	0.0991	1.4896	
YENN	0.60358	0.4420	1.4790	

Appendix Two
Results of Trend Analysis

A2.1 Model Coefficients

β	Variable coefficient
t	Student's t-statistic for coefficient
p(t)	Significance of t (p-value)
LinR	Linear Regression (no time series process)
AR(1)	First-order autoregressive process
clock	Time variable increasing by 1 each quarter
pulse_1 . . . _3	Pulse dummy variables
const	Model constant

Institution	Model	Variable	β	t	p(t)
ACFE	AR(1)	AR(1)	0.820691	6.802	0.0000
		clock	0.007755	2.440	0.0259
		const	0.072429	0.700	0.4934
ADCU	AR(1)	AR(1)	0.391861	1.798	0.0900
		clock	0.002634	5.010	0.0001
		const	-0.012497	0.017	0.4690
AGRI	AR(1)	AR(1)	0.600310	2.348	0.0313
		clock	0.009546	5.379	0.0000
		const	0.174965	3.063	0.0070
ALBU	AR(1)	AR(1)	0.729447	2.847	0.0159
		clock	0.013370	2.847	0.0159
		const	-0.208086	-1.286	0.2250
AMPE	AR(1)	AR(1)	0.889358	8.885	0.0000
		clock	0.034499	5.428	0.0000
		const	-0.706536	-3.368	0.0037

AVIA	LinR	clock	-0.002936	-1.550	0.1384
		const	0.382217	6.303	0.0000
BANA	LinR	clock	0.008359	7.801	0.0000
		const	0.066363	1.934	0.0690
BANK	AR(1)	AR(1)	0.668120	3.887	0.0013
		clock	0.011982	4.115	0.0008
		pulse_1	-0.094321	-3.465	0.0032
		const	0.148898	1.585	0.1325
BCUL	AR(1)	AR(1)	0.873283	9.763	0.0000
		clock	0.016347	3.481	0.0029
		const	0.242568	1.572	0.1344
BERR	AR(1)	AR(1)	0.627862	3.232	0.0049
		clock	-0.015337	-2.943	0.0091
		const	0.923548	5.503	0.0000
BIGR	AR(1)	AR(1)	0.516742	1.611	0.1520
		clock	0.006356	2.913	0.0226
		pulse_1	-0.038850	-2.600	0.0354
		const	0.489707	8.099	0.0001
BLMO	AR(1)	AR(1)	0.468974	1.778	0.0988
		clock	0.005682	6.308	0.0000
		const	0.373016	13.832	0.0000
BORA	AR(1)	AR(1)	0.827657	7.436	0.0000
		clock	0.023931	6.242	0.0000
		const	-0.553847	-4.433	0.0004
BROK	AR(1)	AR(1)	0.884749	9.981	0.0000
		clock	0.013067	1.878	0.0787
		const	-0.181979	-0.784	0.4442
BROO	LinR	clock	0.024434	9.793	0.0000
		const	-0.638915	-6.994	0.0001
CALA	AR(1)	AR(1)	0.475494	2.177	0.0439
		clock	0.005385	6.035	0.0000
		const	-0.087381	-3.049	0.0073
CAPE	AR(1)	AR(1)	0.347023	1.554	0.1387

		clock	-0.004306	-1.028	0.3182
		const	0.618850	4.608	0.0003
CAPR	AR(1)	AR(1)	0.702993	4.270	0.0005
		clock	0.004152	0.850	0.4070
		const	0.002403	0.015	0.9880
CARE	LinR	clock	-0.005550	-6.414	0.0000
		const	0.487555	16.220	0.0000
CBOA	AR(1)	AR(1)	0.758190	5.314	0.0001
		clock	0.014499	3.213	0.0054
		const	-0.186057	-1.257	0.2268
CITY	AR(1)	AR(1)	0.357211	1.600	0.1280
		clock	0.005590	2.062	0.0549
		const	0.274769	3.159	0.0057
COAS	AR(1)	AR(1)	0.784250	4.799	0.0002
		clock	0.002029	0.350	0.7307
		const	0.477310	2.537	0.0212
COMF	LinR	clock	0.000117	0.205	0.8401
		const	0.213994	11.658	0.0000
COMP	AR(1)	AR(1)	0.850747	8.410	0.0000
		clock	-0.002322	-1.385	0.1839
		const	0.371473	6.778	0.0000
COMT	AR(1)	AR(1)	0.849166	7.247	0.0000
		clock	0.022828	3.427	0.0057
		const	-0.507685	-2.167	0.0531
CSRE	AR(1)	AR(1)	0.727574	4.154	0.0011
		clock	0.012538	2.806	0.0149
		const	-0.214627	-1.411	0.1818
CWCU	LinR	clock	0.005296	7.081	0.0000
		const	0.302380	13.542	0.0000
DEPE	AR(1)	AR(1)	0.305513	1.256	0.2262
		clock	-0.008016	-10.684	0.0000
		const	0.703351	29.315	0.0000
DUBB	AR(1)	AR(1)	0.443609	1.846	0.0824

		clock	0.003429	6.113	0.0000
		const	-0.053427	-2.966	0.0087
ELCO	AR(1)	AR(1)	0.828493	6.939	0.0000
		clock	0.002703	0.652	0.5255
		const	0.328210	2.313	0.0377
ENDE	AR(1)	AR(1)	0.509044	2.283	0.0364
		pulse_2	-0.120046	-6.337	0.0000
		clock	0.004345	3.010	0.0083
		const	0.260729	5.617	0.0000
ESSO	AR(1)	AR(1)	0.479518	2.415	0.0273
		clock	0.002212	1.143	0.2688
		const	0.577299	9.287	0.0000
EURO	AR(1)	AR(1)	0.435864	1.456	0.1711
		clock	0.003923	1.977	0.0715
		const	0.011105	0.163	0.8732
FBEC	AR(1)	AR(1)	0.613648	3.097	0.0066
		clock	0.021123	30.865	0.0000
		const	-0.208509	-9.463	0.0000
FIRS	LinR	clock	-0.006762	-2.827	0.0112
		const	0.797036	10.404	0.0000
GIOS	AR(1)	AR(1)	0.683203	2.394	0.0436
		clock	0.007374	2.021	0.0779
		const	-0.175316	-1.488	0.1751
GOSF	AR(1)	AR(1)	0.905153	10.917	0.0000
		clock	0.020864	6.323	0.0000
		const	-0.366017	-3.341	0.0039
GREA	AR(1)	AR(1)	0.681874	4.893	0.0001
		clock	-0.001650	-0.760	0.4577
		const	0.135605	1.936	0.0697
HARD	AR(1)	AR(1)	0.460075	1.832	0.0869
		clock	0.010516	3.883	0.0015
		const	-0.092836	-1.047	0.3118
HIBE	AR(1)	AR(1)	0.685714	3.884	0.0012

		clock	-0.002973	-1.335	0.1996
		const	0.828976	11.534	0.0000
HMCS	AR(1)	AR(1)	0.666057	3.871	0.0012
		clock	0.021380	4.649	0.0002
		const	-0.339772	-2.291	0.0350
HOLI	LinR	clock	0.002357	2.127	0.0516
		const	0.403221	10.761	0.0000
HORI	AR(1)	AR(1)	0.705264	4.387	0.0004
		clock	0.006998	1.811	0.0879
		const	0.235562	1.887	0.0763
HUUN	AR(1)	AR(1)	0.920150	12.676	0.0000
		clock	0.008594	3.553	0.0024
		const	0.202677	2.504	0.0228
ILLW	AR(1)	AR(1)	0.834573	7.580	0.0000
		clock	0.007582	6.546	0.0000
		const	0.235343	6.230	0.0000
INTE	LinR	clock	0.042956	7.024	0.0000
		const	-1.193506	-5.471	0.0003
LABS	AR(1)	AR(1)	0.638300	4.200	0.0006
		clock	0.023396	2.941	0.0091
		const	-0.043793	-0.171	0.8664
LECU	AR(1)	AR(1)	0.401910	1.755	0.0972
		clock	-0.005355	-3.560	0.0024
		const	0.563041	11.661	0.0000
LMCU	AR(1)	AR(1)	0.450943	1.836	0.0893
		clock	0.008921	7.049	0.0000
		const	0.001593	0.042	0.9671
MACO	AR(1)	AR(1)	0.455191	1.683	0.1267
		clock	0.009407	2.259	0.0503
		const	0.136846	1.183	0.2672
MACQ	AR(1)	AR(1)	0.699592	4.298	0.0005
		clock	0.010178	9.164	0.0000
		const	0.080651	2.249	0.0380

MARI	AR(1)	AR(1)	0.932000	13.826	0.0000
		clock	-0.003459	-1.962	0.0664
		const	0.400289	6.726	0.0000
MAWA	AR(1)	AR(1)	0.818606	6.774	0.0000
		clock	-0.004284	-2.899	0.0100
		const	0.603760	12.553	0.0000
MCUL	AR(1)	AR(1)	0.923185	14.338	0.0000
		clock	0.004983	1.914	0.0726
		const	0.320490	3.672	0.0019
MMCU	AR(1)	AR(1)	0.729036	4.814	0.0002
		clock	-0.004932	-4.383	0.0004
		const	0.400065	10.999	0.0000
MONI	AR(1)	AR(1)	0.810116	4.141	0.0020
		clock	0.012187	3.665	0.0044
		const	0.036263	0.335	0.7445
MSBC	AR(1)	AR(1)	0.729547	4.397	0.0004
		clock	0.008610	2.304	0.0341
		const	0.187817	1.555	0.1385
MUCL	AR(1)	AR(1)	0.649640	3.018	0.0117
		clock	0.005391	1.979	0.0734
		const	0.125009	1.316	0.2149
NBUS	AR(1)	AR(1)	0.630926	3.325	0.0043
		clock	0.008772	1.870	0.0799
		pulse_1	0.180776	3.781	0.0016
		const	0.106028	0.701	0.4933
NCIT	AR(1)	AR(1)	0.639509	3.161	0.0057
		clock	-0.004935	-4.452	0.0004
		const	0.430138	12.044	0.0000
NENG	AR(1)	AR(1)	0.625790	3.370	0.0036
		clock	-0.004693	-1.516	0.1479
		const	0.652708	6.547	0.0000
NIND	AR(1)	AR(1)	0.646361	3.601	0.0022
		clock	0.008508	3.310	0.0041

		const	0.254576	3.073	0.0069
NOVA	AR(1)	AR(1)	0.773816	4.059	0.0028
		clock	0.010788	2.541	0.0316
		const	0.254043	2.107	0.0644
NRIV	AR(1)	AR(1)	0.829177	7.949	0.0000
		clock	0.018613	7.846	0.0824
		const	-0.234544	-0.714	0.4851
NRMA	AR(1)	AR(1)	0.826956	7.302	0.0000
		clock	0.017106	4.500	0.0003
		const	-0.220554	-1.781	0.0928
NSWT	AR(1)	AR(1)	0.455653	2.006	0.0610
		clock	0.003666	6.678	0.0000
		const	0.244114	13.847	0.0000
ORAN	AR(1)	AR(1)	0.519681	1.949	0.0679
		clock	-0.001184	-1.322	0.2036
		const	0.454280	15.788	0.0000
ORIO	AR(1)	AR(1)	0.787051	4.382	0.0011
		clock	0.009608	4.768	0.0006
		const	0.463837	7.904	0.0000
ORMU	AR(1)	AR(1)	0.820210	5.976	0.0000
		clock	0.004933	6.220	0.0000
		const	0.265869	10.298	0.0000
PARK	LinR	clock	0.015773	2.339	0.0441
		const	-0.334667	-1.373	0.2029
PBBC	LinR	clock	0.006873	1.963	0.0973
		const	-0.164945	-1.254	0.2564
PCUL	AR(1)	AR(1)	0.565752	2.359	0.0306
		clock	-0.006848	-7.058	0.0000
		const	0.674243	21.607	0.0000
PEEL	AR(1)	AR(1)	0.889319	8.120	0.0000
		clock	0.011676	1.945	0.0737
		const	0.004235	0.023	0.9820
PHOE	AR(1)	AR(1)	0.843312	7.662	0.0000

		clock	0.005957	3.441	0.0031
		const	0.257112	4.547	0.0029
POWE	AR(1)	AR(1)	0.920098	12.365	0.0000
		clock	0.018243	6.221	0.0000
		const	-0.181409	-1.849	0.0820
PROS	AR(1)	AR(1)	0.607627	2.654	0.0167
		clock	-0.003274	-3.766	0.0015
		const	0.648090	23.154	0.0000
PUNC	LinR	clock	0.001322	2.213	0.0440
		const	0.305785	15.139	0.0000
QANT	AR(1)	AR(1)	0.794036	6.910	0.0000
		clock	0.007430	9.137	0.0000
		const	0.311825	11.811	0.0000
RALE	AR(1)	AR(1)	0.622060	3.287	0.0044
		clock	0.016593	7.980	0.0000
		const	-0.026660	-0.398	0.6955
RELI	AR(1)	AR(1)	0.701368	4.356	0.0004
		clock	-0.009820	-1.202	0.2460
		const	0.556632	2.110	0.0500
RESO	AR(1)	AR(1)	0.405142	1.892	0.0756
		clock	0.006864	1.558	0.1377
		const	0.119058	0.842	0.4116
ROTH	AR(1)	AR(1)	0.512566	2.511	0.0224
		clock	-0.008678	-2.596	0.0188
		const	0.584108	5.437	0.0000
RTAS	AR(1)	AR(1)	0.449848	2.077	0.0533
		clock	0.021732	5.058	0.0001
		const	-0.266480	-1.931	0.0703
RYDE	AR(1)	AR(1)	0.585434	2.933	0.0093
		clock	0.006199	2.322	0.0329
		const	-0.029499	-0.343	0.7355
RYOM	AR(1)	AR(1)	0.457798	1.733	0.1067
		clock	-0.008522	-3.152	0.0076

		const	0.519914	6.425	0.0000
SCCU	AR(1)	AR(1)	0.882103	10.404	0.0000
		clock	0.002661	1.530	0.1445
		const	0.479871	8.377	0.0000
SECU	LinR	clock	0.014438	5.989	0.0000
		const	-0.250166	-3.241	0.0045
SELE	LinR	clock	0.019843	4.025	0.0024
		const	-0.022399	-0.164	0.8731
SHEL	LinR	clock	0.014000	9.999	0.0000
		const	0.042901	0.859	0.4104
SHOA	LinR	clock	0.011603	10.445	0.0000
		const	0.200241	6.763	0.0001
SNOW	AR(1)	AR(1)	0.576171	2.452	0.0366
		clock	0.007458	3.598	0.0058
		const	0.275822	4.783	0.0010
STGE	LinR	clock	-0.005940	-2.759	0.0129
		const	0.682875	9.905	0.0000
STHE	LinR	clock	0.003061	2.491	0.0227
		const	0.195408	4.967	0.0001
SUMM	AR(1)	AR(1)	0.876326	6.709	0.0000
		clock	0.010484	2.842	0.0139
		const	0.319701	2.832	0.0141
SUTH	AR(1)	AR(1)	0.734969	5.010	0.0001
		clock	0.009324	4.485	0.0004
		const	0.129060	1.895	0.0763
SWSC	AR(1)	AR(1)	0.560496	3.085	0.0067
		clock	0.017132	15.085	0.0000
		const	-0.323327	-8.852	0.0000
SYDN	LinR	clock	0.006351	10.611	0.0000
		const	0.343004	20.676	0.0000
TABS	AR(1)	AR(1)	0.799114	5.160	0.0009
		clock	0.054213	-2.116	0.0673
		const	-1.307107	-2.116	0.0673

TAFE	AR(1)	AR(1)	0.798390	5.797	0.0000
		clock	0.008903	2.696	0.0153
		const	-0.215178	-2.035	0.0578
TART	AR(1)	AR(1)	0.531136	2.577	0.0196
		clock	0.009157	2.669	0.0162
		const	-0.087021	-0.789	0.4410
TCUL	AR(1)	AR(1)	0.907210	10.314	0.0000
		clock	0.012746	5.141	0.0001
		const	0.018889	0.229	0.8214
TELS	AR(1)	AR(1)	0.857569	6.181	0.0002
		clock	0.023924	2.405	0.0396
		const	-0.261216	-0.930	0.3765
TRAN	AR(1)	AR(1)	0.664103	3.714	0.0026
		clock	0.017891	3.703	0.0027
		const	-0.424755	-2.587	0.0225
UNIC	AR(1)	AR(1)	0.452116	2.091	0.0518
		clock	0.009288	3.338	0.0039
		const	0.216959	2.429	0.0265
UPPE	AR(1)	AR(1)	0.351284	1.535	0.1431
		clock	0.008222	3.446	0.0031
		const	0.235072	3.071	0.0069
WAGG	LinR	clock	0.011864	6.858	0.0000
		const	-0.023042	-0.416	0.6824
WEST	LinR	clock	0.008452	2.370	0.0292
		const	-0.011644	-0.102	0.9199
WYON	AR(1)	AR(1)	0.784004	4.813	0.0003
		clock	0.014312	4.532	0.0006
		const	0.128926	1.351	0.1998
YENN	AR(1)	AR(1)	0.665581	3.997	0.0009
		clock	0.010135	5.634	0.0000
		const	-0.222130	-3.829	0.0013

A2.2 Diagnostics

Linear Regressions:

F	F-statistic
p(F)	Significance of F
DW	Durbin-Watson statistic

Autoregressive models:

AIC	Aikike's Information Criterion

Institution	F	p(F)	DW	AIC
ACFE				-86.2961
ADCU				-128.2944
AGRI				-91.6022
ALBU				-41.3715
AMPE				-66.0611
AVIA	2.40400	0.1384	2.4155	
BANA	60.85784	0.0000	1.6135	
BANK				-75.6006
BCUL				-76.3046
BERR				-50.3948
BIGR				-60.5924
BLMO				-97.7910
BORA				-79.4962
BROK				-60.4250
BROO	95.89489	0.0000	2.6051	
CALA				-111.5305
CAPE				-43.1207
CAPR				-58.5704
CARE	41.13589	0.0000	2.2484	
CBOA				-65.1267
CITY				-60.9851
COAS				-58.7005
COMF	0.04188	0.8401	1.5997	

COMP				-115.0237
COMT				-50.3801
CSRE				-59.0199
CWCU	50.14716	0.0000	1.2143	
DEPE				-109.9725
DUBB				-128.3613
ELCO				-67.8069
ENDE				-93.2434
ESSO				-80.7878
EURO				-69.2076
FBEC				-130.6151
FIRS	7.99099	0.0112	1.3540	
GIOS				-51.8842
GOSF				-94.0893
GREA				-89.3509
HARD				-61.4640
HIBE				-88.6209
HMCS				-58.1362
HOLI	4.52619	0.0516	1.1938	
HORI				-68.1096
HUUN				-108.4458
ILLW				-128.0915
INTE	49.33257	0.0000	1.4936	
LABS				-34.1991
LECU				-86.7460
LMCU				-86.1888
MACO				-44.7001
MACQ				-117.5394
MARI				-122.5999
MAWA				-116.7130
MCUL				-105.8915
MMCU				-119.4127
MONI				-64.5909

MSBC				-71.4374
MUCL				-65.9360
NBUS				-53.8672
NCIT				-113.1213
NENG				-71.0794
NIND				-79.9678
NOVA				-54.0319
NRIV				-40.9712
NRMA				-79.7654
NSWT				-129.8736
ORAN				-113.9247
ORIO				-80.6234
ORMU				-141.7716
PARK	5.47218	0.0441	1.4175	
PBBC	3.85423	0.0973	1.7222	
PCUL				-113.5209
PEEL				-60.3129
PHOE				-112.9336
POWE				-100.7410
PROS				-120.6326
PUNC	4.89843	0.0440	1.3443	
QANT				-138.2007
RALE				-86.7387
RELI				-37.8487
RESO				-43.9211
ROTH				-60.8063
RTAS				-47.2579
RYDE				-74.3045
RYOM				-62.1724
SCCU				-117.0435
SECU	35.87000	0.0000	1.9108	
SELE	16.19982	0.0024	1.0892	
SHEL	99.97207	0.0000	1.4870	

SHOA	109.09963	0.0000	2.0062	
SNOW				-64.7812
STGE	7.61268	0.0129	1.9566	
STHE	6.20654	0.0227	1.5449	
SUMM				-74.9235
SUTH				-92.7253
SWSC				-106.8873
SYDN	112.58455	0.0000	1.0972	
TABS				-16.5326
TAFE				-80.0694
TART				-60.8659
TCUL				-105.8649
TELS				-36.7569
TRAN				-53.0204
UNIC				-64.7691
UPPE				-65.8105
WAGG	47.02602	0.0000	1.4889	
WEST	5.61554	0.0292	1.8795	
WYON				-73.5526
YENN				-95.6458